COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper Second-class postage paid at Framingham, Mass. and additional mailing offices ©1983 by CW Communications/Inc.
$1.50 a copy; $44/year January 31, 1983 Vol. XVII, No. 5

NEWSPAPER

SPECIAL REPORT

Inside — Data Communications Networks: The Long and Short of It

Salaries for DP Operations In Good Shape: Afcom Survey

By Bob Johnson
CW New York Bureau

ANAHEIM, Calif. — Computer operations personnel are faring well in this gloomy economy. Nearly all salaries in operations job categories rose in 1982, and projections for 1983 show substantial increases as well, according to the annual salary survey conducted by the Association for Computer Operations Managers.

Afcom's 1982/83 survey included data entry, data control, computer operations and DP operations job titles. The salary breakdown was performed on a monthly basis and included three variations: national, geographic and size of installation. National salaries represent all areas of the country; the geographic listings include the Western, Eastern, Midwestern and Southern regions; and the size of installation breakdown measures salaries by equivalent monthly rental of installed hardware.

In the area of DP operations management, the survey showed DP operations managers at a national average monthly salary of $2,918, representing a 13.3% gain over last year's figures. Operations managers had the best average salaries in the West, revealing a monthly figure of $3,367. Afcom's 1983 projections point to an 8.4% increase.

Job schedulers, the only category in the survey that did not show an increase, had an average salary of $1,596/mo, compared to last year's $1,602/mo. Regionally, however, the scheduler's pay was strong in the Midwest, where it averaged $1,862/mo. Projections for next year show a 7.3% increase.

An operations analyst's average national monthly salary was $2,037, with a 1983 increase slated for 6.3%,

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Drops Corporate Tax Hint

Reagan Lauds High-Tech Heartland

By Bill Laberis
CW Staff

BEDFORD, Mass. — President Ronald Reagan brought his free-enterprise juggernaut to the high-technology heartland here last week, saying the success of the computer and electronics industry in Massachusetts serves as a metaphor for the nation's strength and hope for the future.

But it was Reagan's surprise suggestion that the government abolish the federal corporate income tax that brought the only applause interruption from the high-tech executives during his one-hour visit with them at Millipore Corp. headquarters here.

"I'll probably kick myself for saying this," Reagan said. "The corporate tax is very hard to justify."

Speaking to members of the Massachusetts High Technology Council during part of a whirlwind, four-hour tour of Greater Boston, Reagan pledged he would include in his proposed budget submission this week "unprecedented increases" in government-sponsored research and development. The benefits of this research, he said, will be channeled into "our more promising areas," a specific allusion to the high-technology industries.

The president further promised he would devise and submit a definitive plan designed to help families pay the rising costs of education, thereby helping to bridge the gap between the number of electronics graduates and the greater number of jobs begging for them.

Despite his State of the Union address on Jan. 25, in which he suggested government take a more active role in promoting economic recovery, the president also made it clear he still believes business thrives best in an environment where both taxes and government intervention are kept at a minimum.

"This [state] is a living laboratory of progress and proof that the private sector can work with local govern-

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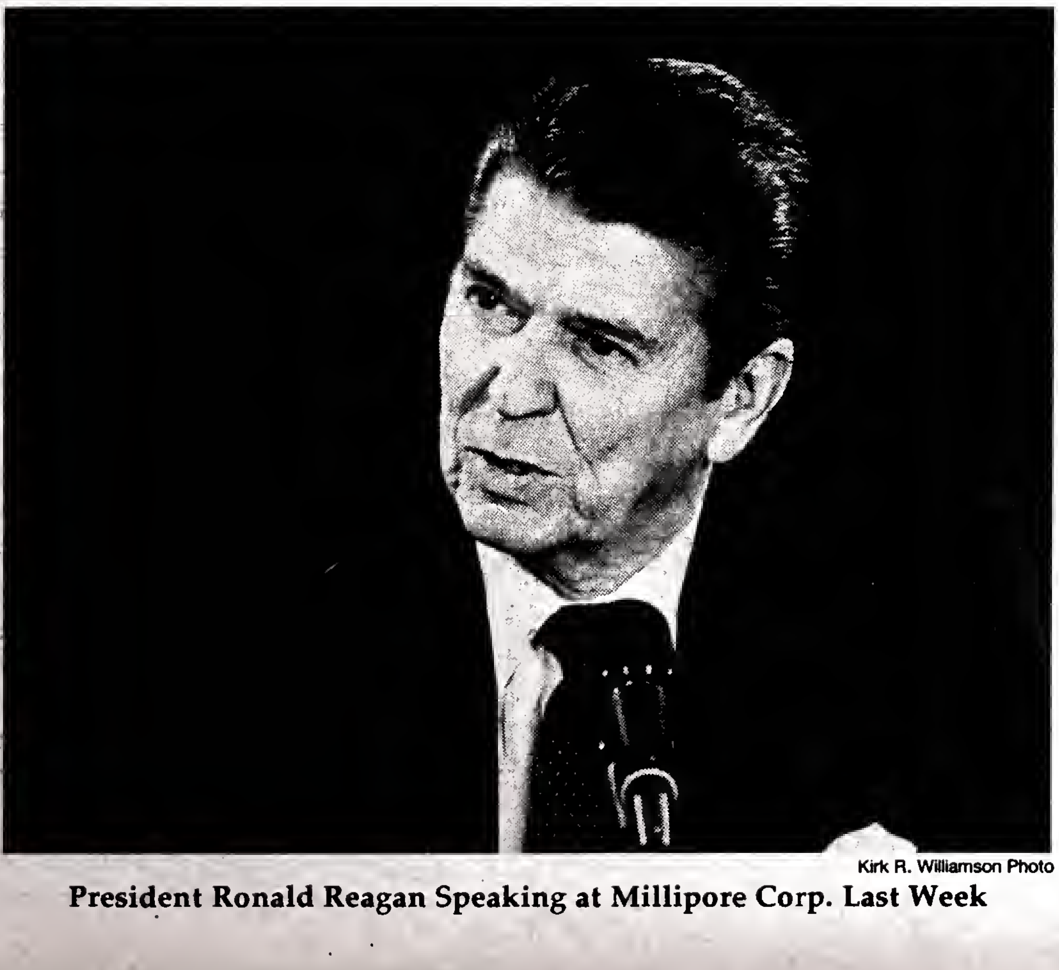

Kirk R. Williamson Photo

President Ronald Reagan Speaking at Millipore Corp. Last Week

U.S. Observers Eye Soviet Tech

By Jim Bartimo
CW Staff

Whether the Soviet Union is ahead, behind or keeping pace with U.S. computer technology depends upon whom one asks.

Some industry experts contacted by *Computerworld* last week said that Soviet military technology is quite advanced, but most agree that commercial applications are three to five years behind the U.S.

"The technology of the country is superb, but dedicated to a different cause," according to Charles P. Lecht, president of the New York-based think tank, Lecht Sciences, Inc. Lecht has traveled to the Soviet Union to observe Soviet computers and reported his findings to legislative committees.

(Continued on Page 5)

Trends Impact Software Profile

By Robert Batt
CW West Coast Bureau

The increasing use of contract programmers, fourth-generation languages and the information center concept will all have an important influence on software developments in 1983.

These are the main conclusions drawn from recent interviews conducted with several computer industry association representatives and management information systems executives.

According to Steven Epner, founder of the Independent Computer Consultants Association, which represents 1,000 companies nationwide, the last three to four months have seen a significant increase in the demand for third-party programmers.

"During the recession, many companies cut back by imposing hiring freezes and reducing the size of their data processing staff. Users, on the other hand, did not cut back on their demand for services, so that now there is a lot of pent-up demand for DP. In an attempt to satisfy this demand, computer departments, which still face a freeze on head count, are being forced to turn to outside contractors for assistance," Epner said.

Another trend that seems to be accelerating is the shift toward so-called fourth-generation languages. Bill Costello, vice-chairman of the Greater Boston chapter of the Associ-

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Second-class postage paid at Framingham, Mass., and additional mailing offices PN127420. *Computerworld* **(ISSN-0010-4841) is published weekly, except: February (5 issues), April (5 issues), May (6 issues), June (5 issues), August (7 issues), September (5 issues), October (7 issues), November (5 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/ Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.**

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Special requests should be addressed to Nancy M. Shannon, CW Communications/Inc. Box 880, 375 Cochituate Rd., Framingham, MA 01701. ISSN **0010-4841/82 $3.00 + $.50**

$1.50 a copy: U.S. — $44 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year; all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

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First All-Electronic Novel Published

By Jim Bartimo
CW Staff

It was the day after the end of the world . . . Philip had hoped to pull off a miracle and had managed to do just the reverse. He had pitted everything on one clever move — and lost,

Hundreds of fashionable people — in fact, the whole artistic community of the city — had appeared in the freight elevator only a few hours before. The most important, or rather the most influential of the newpaper journalists, was the personable Suede.

So reads an excerpt of what is thought to be the first electronically published novel, which was recently made available to subscribers of Source Telecomputing Corp.'s The Source public data base system.

Blind Pharaoh was written in Toronto in 61½ hours on an Apple Computer, Inc. Apple III. The 20,000-word book was edited chapter by chapter on another Apple at Source's headquarters in McLean, Va., where nine Prime Computer, Inc. 750 minicomputers allow 24,000 subscribers to access the data base through modems at 1,200 bit/sec, according to a Source spokesman.

The 19-chapter book is available for as little as $2.03 by calling it up on a home computer and downloading it to a floppy disk or printer for storage, a company spokesman said.

Author Burke Campbell, a native of Texas and resident of Toronto, had previously written another three-day novel for a local contest and has also authored radio dramas for the Canadian Broadcasting Co.

"*Blind Pharaoh* is a mystery thriller," Campbell said last week. "It's the story of a mysterious man who travels around North America in his limousine manipulating the lives of other people. It's a kind of science fiction novel, but most of the technology in it already exists.

"It's very chic and very sexy," he noted.

Also chic and sexy were the conditions under which the quickie novel was written. The three-day writing spree was a media event held at an art gallery to coincide with a Canadian computer show also held in Toronto.

"I arrived in a black chauffeur-driven limousine in a sweat suit made out of black sequins and I wore black cowboy boots," Campbell said. "I mounted the black vinyl stage and there was the microcomputer."

Campbell wrote for most of the three days following his arrival, seldom leaving the stage as his meals were brought to him. "I was working from a general outline, but I wrote most of it right then," Campbell said. Campbell said he was surprised at the impact his novel is having and said that the new method of distribution has touched a nerve with the public. He also said he enjoyed writing a book that was so quickly delivered to the reading public.

"I think the business community must understand that the artist will show how this technology will be used," Campbell noted. "Fashion plays a very large part in this, so the artist is much more influential than the businessman."

Asian Center Urges Resolution Of U.S. Trade Disputes With Japan

WASHINGTON, D.C. — The U.S. should immediately draft a concrete timetable for resolving trade disagreements between this country and Japan.

That is one of several recommendations on U.S.-Japanese trade and defense topics offered in a report released by the Asian Studies Center, an influential think tank based here that is pushing for immediate action for the U.S. to acknowledge improved U.S.-Japanese relations — especially following a recent visit here by Japanese Prime Minister Yasuhiro Nakasone.

The center is part of the Heritage Foundation, a politically conservative policies study group. It officially came into being last Tuesday and is headed by Richard V. Allen, former national security adviser to President Ronald Reagan.

"At times in recent months, the trade-related recriminations that Japan and the U.S. have hurled at each other almost have blurred the fact that the two nations have enormously strong and warm ties binding them to each other," the report said. "It is the underlying strength of the relationship that makes it so important to resolve the trade differences," the study said, calling the trade issue "urgent" and the "single most divisive matter" in U.S.-Japanese relations.

Noting Secretary of State George Shultz's upcoming visit to Japan, the Asian center suggested his talks with Japanese officials would provide a good opportunity to begin development of "a five-year plan with specific target figures" to reduce the trade imbalance between the two countries.

This Week

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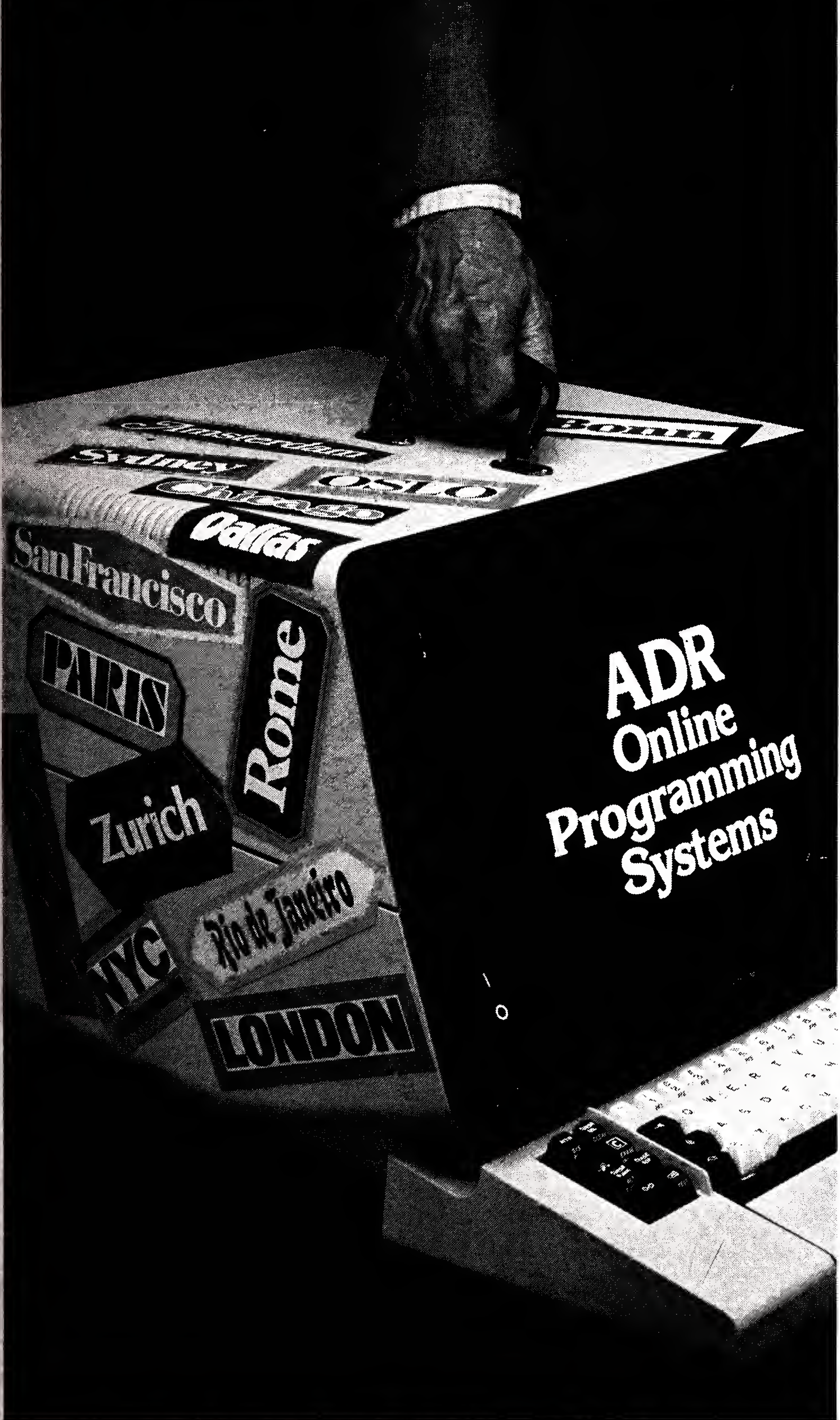

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Reagan Lauds Success of High-Tech Heartland

Kirk R. Williamson Photo

President Ronald Reagan Addresses Massachusetts High-Tech Executives

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ment and move forward," he said.

Reagan began his day with a visit to the Opportunities Industrial Center, a federally and privately funded training center at which unemployed Bostonians learn word processing and other computer fundamentals. Speaking of his visit to the center, Reagan commented, "I had the privilege of looking into America's future, and the future looked good."

However, the center operates today on half the money it was allocated two years ago, and therefore has half the trainees. Ironically, the budget cuts originated in Washington as a result of Reagan administration cost-cutting initiatives.

Reagan also visited a Digital Equipment Corp. assembly plant in Roxbury, a nearly all black and very economically depressed area of the city. The DEC plant, the only building standing in what was supposed to be an industrial park, was made possible in part by various federal programs designed to include the urban poor in the high-tech boom.

Some $7 million in federal funds built roads into the park, and DEC's $3 million plant investment was financed with tax-free industrial revenue bonds. The Reagan administration tried — and failed — to eliminate the revenue-bond program.

After an unscheduled stop for a beer and handshakes at a local Irish pub, Reagan left Boston for Millipore's headquarters, located in the heart of the Rt. 128 high-tech belt. He was warmly greeted by a packed house of electronics industry executives and High Technology Council representatives.

The president had come to Boston at the request of Dee d'Arbeloff, Millipore's chairman, who said the president's journey to Massachusetts "is a clear indication of his interest in high-technology industry."

But clearly, it was the area's jobs-producing record over the last four years, during which over 60,000 new jobs were developed by high-tech firms, that drew Reagan here. And it was in the interest of preserving the relative health of the area's and nation's high-tech companies that council members proposed to Reagan specific ways in which the federal government could lend a hand.

Ray Stata, president of Analog Devices, Inc., told Reagan, "It is a simple fact that our educational system today does not have the capacity to educate and train enough people with the right qualifications to sustain our industry's growth."

Stata said this "national tragedy" in education impairs high-tech growth and could retard Reagan's planned military buildup with "a lack of qualified people to design, build and operate a new generation of intelligent weapon systems.

"In reality, we're fighting a cold war on two fronts — militarily with Russia and economically with Japan, but with the same troops, namely our technological work force," Stata told the president.

On the council's behalf, Stata proposed a matching grant program whereby the federal and state governments would match industry grants made to technical education and university research.

Replying to a council question on trade barriers, Reagan said he, like the council, favors free trade, but only with those countries that do not erect tariff and nontariff barriers to trade. In a probable reference to Japan, Reagan said, "There are some countries we trade with who make it very difficult for our products to enter their markets," saying that other nations are "zeroing in on our high-tech markets."

High-Tech Execs See Visit as 'Open Door'

By Bill Laberis
CW Staff

BEDFORD, Mass. — "We have his attention now. The words 'high tech' are now on his agenda, and he understands it is an important aspect of the economy. It's a real breakthrough, more than we could have dreamed happening. We now have an open door."

In this way, Edson deCastro, president of Data General Corp., enthusiastically summarized President Ronald Reagan's visit last week to Millipore Corp. here to address the Massachusetts High Technology Council.

Shortly after Reagan departed for Washington, deCastro noted that it was probably the lingering national unemployment problem that sent the president to Massachusetts, as the computer industry represents "a sector not having big unemployment problems."

Bit of Irony

As Reagan's detractors and critics pointed out, there was a bit of irony in his visit to both a Digital Equipment Corp. inner-city assembly plant and to a federally funded computer training center. Budget cuts favored or proposed by Reagan would adversely impact similar projects, both of which the president touted.

"Of course, in politics there is a risk when you begin to cut programs," deCastro said. "You have to be very careful of the consequences. Now, we have a voice in the White House and that voice will be heard."

Asked what the federal government should do to help the high-tech sector, deCastro said increased direct aid to higher education is in order, as well as the imposition and enforcement of tougher testing standards in elementary and secondary schools across the country.

"It would also be prudent for the government to foster an economic and tax environment conducive to risk taking and investment," deCastro said.

Another member of the High Technology Council, John Cullinane of Cullinane Database Systems, Inc., said he believes Reagan is "fascinated and interested in entrepeneurs . . . which he sees as a big part of the American success story."

Asked what he would like the federal government to do for high tech, Cullinane suggested the president should act to eliminate the differences in the cost of capital in Japan and the U.S. The government should "make sources of funds easier and cheaper to acquire . . . There has not been enough emphasis on this point," Cullinane remarked.

And Roger Wellington, chairman of Augat, Inc., said the government should work to eliminate tax biases that discourage high-growth companies.

"The effective tax paid by companies in the $25 million to $1 billion range during 1976 to 1980 was more than double that paid by companies in the Fortune 100 list — almost 35% against only slightly more than 15%," he said.

Congress Also to Address DP Issues

WASHINGTON, D.C. — While 1983 may be remembered as the year of big politics, and even President Reagan officially recognized high tech, there was evidence last week that congressional subcommittees have long appreciated the importance of high technology to the nation's future.

In a document entitled "The Future Agenda" — released Tuesday by the Congressional Clearinghouse on the Future — computers, communications, robotics and a host of related social, judicial and economic issues were heavily emphasized as matters that will receive special attention in the future sessions by the committees and staff of the House of Representatives.

The list of future "legislative challenges," broken down by committee and subcommittee, was prepared to involve the Congress in a national dialogue on the future, according to Rep. Albert Gore Jr. (D-Tenn.), who is the Clearinghouse chairman. The Clearinghouse is a bipartisan organization of 75 congressmen and senators created, in Gore's words, "to provide structured opportunities for members of Congress to take time out from hectic events to consider a longer-term perspective."

Gore noted, "The entire world — and outer space, too, for that matter — is broken down into different jurisdictions, which are then assigned to the roughly 200 subcommittees." The compilation of "The Future Agenda" over a two-year period has already led some subcommittees to rethink their priorities, according to Gore.

High-technology issues noted in the agenda include the effects on education, citizens' rights and employment of the advent of the information-intensive, services-oriented economy. Research and development, deregulation of the telecommunications industry, computer crime, transborder data flow and office automation are just some of the many high-technology issues presently before numerous House subcommittees.

The purpose of the agenda, Gore said, is not to list subcommittee preferences for disposing of these issues, but to identify better the range of choices that will be available to Congress when the matters come up for legislative deliberation and to give the public greater access to the development of those choices. "We have to spend a little more time anticipating problems before they become crises," Gore said.

U.S. Observers Analyze Soviet Technology

(Continued from Page 1)

"Americans go over there and see no banking systems," Lecht said. "The conclusion they come to is that the Soviets know nothing about computers. But they forget that the Soviets don't have many banks."

Military Uses

Much of the Soviets' computer technology is devoted to military applications, Lecht said. The Soviets have access to superior memory technology from Poland and superior processor technology from Czechoslovakia and Hungary. The country's large-scale integration capability was termed by Intel Corp. in 1980 to be within a year of the capability of the U.S., Lecht said.

Also considered superior are the Soviets' processor control capabilities, including computer-aided design and computer-aided manufacturing. "Their processor control is the best in the world," Lecht said. "It's one thing to send a man to the moon — it's another to send a robot up" that performs the duties of a man.

But S.E. Goodman, University of Arizona professor of management information systems and public policy, said that Soviet military technology is relatively backward. "The most powerful Soviet scientific computer is comparable to a [Burroughs Corp.] B7700," he said.

Goodman — who has also contributed information on the Soviets to congressional committees — pointed out that Soviet commercial applications are also behind the U.S., but have advanced significantly in recent years. "Their progress has to be measured in two ways — compared to their own past and compared with us. If you look at what they were doing a few years ago," Goodman said, "it looked like American equipment from the 1950s.

"They produce thousands of machines per year," Goodman continued. While the Soviets have made great strides in computer technology, Goodman said, "I'm not going to sell my stock in IBM yet."

Another industry expert, Lynn Gallup of Control Data Corp.'s import/export subsidiary, Control Data Commerce International, Inc., agreed that the Soviets are making more rapid advances — even at the expense of the domestic economy. "The Russians are absolutely determined not to be second-rate," he said. "I don't think Americans understand how far they will go."

Soviets Seen Entering Third Phase

By Jim Bartimo
CW Staff

Many Soviet watchers say there has been an information freeze regarding Soviet computers since the invasion of Afghanistan in 1979. However, the Soviets may be about to enter their third phase of computer development, according to a University of Arizona professor of management information systems and public policy, S. E. Goodman.

"We have not seen the ES-3 [also known as Ryad-III] in production yet, but it's likely to be like the IBM 30 series or 4300," Goodman said.

Phase One of the Soviet computer development involved the Minsk computer line. It is out of production now, but the last of its 32 models was much like an IBM 1410, according to Goodman.

Sometime after the Minsk line of computers came the Ryad I series (also known as the ES-1 series) — a duplicate of the IBM 360. The Ryad II, a duplication of the IBM 370, came shortly after, the University of Arizona professor said.

"In many ways, their technology is our technology," Goodman said. "They've tried to achieve software compatibility and peripheral compatibility."

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Survey Finds Operations Personnel Faring Well

(Continued from Page 1)

according to Afcom. Geographically, this group which was included in the survey did best in the Midwest, coming in with an average monthly salary figure of $2,225.

Operations Managers Up 10.2%

The computer operations group covered nearly the entire gamut of this data processing segment, including such titles as computer operations manager, shift supervisor, senior operator, operator and operator trainee. Operations managers — who are the higher end of the operations spectrum and have immediate control over what occurs in the computer room — had average monthly salaries of $2,257, up 10.2% over last year, with the highest paid portion in the West at $2,381. Projections for 1983 look to be on the average an increase of 8.4%, the Afcom survey said.

Shift supervisors came in at $1,901/mo and are expected to get increases in '83 of 7.7%. Their highest incomes were reported from the West as well, the average there being $2,113.

Operator categories had good results also, Afcom stated. Its survey listed the average monthly salary of a senior operator at $1,539, an operator at $1,282 and an operator trainee at $1,038. Next year's increases are calculated to be 7.6%, 7.6% and 8.0%, respectively.

Reports from the data control area listed salaries for the positions of data control manager, shift supervisor, tape librarian, senior control clerk and control clerk. Data control managers had a national average salary of $2,002, representing a 9.8% increase over 1982, according to the survey.

Data control personnel in the western portion of the U.S. reported the best monthly salaries, averaging about $2,331. Increases in this area for 1983 are predicted to be in the area of 7.3%, Afcom said.

The data control shift supervisor's average national salary was $1,652, with a projected increase of 8.0% for 1983. Tape librarians made $1,182/mo on the average and will get a 7.6% increase, Afcom reported. Senior control clerks earned $1,329/mo nationally, while control clerks earned $1,101/mo representing a 17.1% increase in pay. These groups in the survey have '83 increase projections listed at 7.2% and 7.4%, respectively.

Data Entry Group

The final Afcom category surveyed was data entry. Managers in this operations area had a 15.5% jump in average national salary and posted a figure of $1,723. Their strongest area is the West where a $1,931/mo average was reported. The 1983 expectation based on the survey and reported by Afcom is an 8.2% increase.

Data entry shift supervisors made $1,484/mo on the average and are expected by Afcom to increase that number by 6.8% next year. Highest earnings came out of the West for this group with a $1,630 average. Senior operators were also strong in the West with a $1,310 average salary there. The national average for this group was $1,236. In addition, 1983 increases should be near 7.9%, Afcom said.

The salaries of key-to-disk and keypunch operators showed a 13.7% increase over 1982 with best figures coming out of the Midwest at averages of $1,076 and $1,089, respectively. The national average monthly figures were listed at $1,016 and $1,019, respectively.

DATA ENTRY

JOB TITLE	RANGE	AVERAGE	MEDIAN	PROJECTED 1983 AVERAGE INCREASE
Keypunch Operators	640-1,669	1,019	1,027	7.1%
Key-to-Disk Operator	650-1,600	1,016	1,006	7.4
Senior Operator	725-1,870	1,236	1,106	7.9
Shift Supervisor	833-3,289	1,484	1,450	6.8
Data Entry Manager	900-4,160	1,723	1,700	8.2

DATA CONTROL

JOB TITLE	RANGE	AVERAGE	MEDIAN	PROJECTED 1983 AVERAGE INCREASE
Control Clerk	640-1,725	1,101	1,056	7.4%
Senior Control Clerk	865-2,100	1,329	1,307	7.2
Tape Librarian	650-2,000	1,182	1,153	7.6
Shift Supervisor	725-3,289	1,652	1,600	8
Data Control Manager	1,000-4,160	2,002	2,090	7.3

COMPUTER OPERATIONS

JOB TITLE	RANGE	AVERAGE	MEDIAN	PROJECTED 1983 AVERAGE INCREASE
Operator Trainee	675-1,728	1,038	1,002	8%
Operator	675-2,234	1,282	1,271	7.6
Senior Operator	900-2,425	1,539	1,545	7.6
Shift Supervisor	1,133-3,289	1,901	1,822	7.7
Computer Operations Manager	980-4,160	2,257	2,240	8.4

DATA PROCESSING OPERATIONS

JOB TITLE	RANGE	AVERAGE	MEDIAN	PROJECTED 1983 AVERAGE INCREASE
Operations Analyst	1,078-3,172	2,037	1,968	6.3%
Scheduler	800-3,192	1,596	1,587	7.3
Data Processing Operations Manager	1,385-5,485	2,918	2,844	8.4

Source: Afcom

1982 Salaries and Projected 1983 Increases

Trends Predicted to Impact Software in '83

(Continued from Page 1)

ation of Computing Machinery, claimed the traditional reliance on structured languages, such as Cobol, is diminishing.

"There is an increasing recognition that third-generation languages are inadequate to comply with the enormous amount of software that has to be written. There is going to be a greater demand for application programmers who have developed skills in higher level languages. As soon as large companies recognize the value of these languages, I think we will see a great shift toward them and away from traditional software," Costello asserted.

A major development giving impetus to such a movement is the introduction of the information center concept and the growth of office automation facilities.

Orval Edwards, manager of development environments at Transaction Technology, Inc., a subsidiary of Citicorp, argued: "In the future, there will be a greater need for structured design skills rather than structured programming skills. Knowledge of data communications, local-area networks and microprocessor technology is going to be very important."

The rise of the information center, the industry observers said, will force programmers and analysts to have a far greater knowledge of the user departments with which they work. Costello maintained there will be a growing need for software specialists to possess data dictionary skills.

But several others warned that the entire information center concept was in danger of being mismanaged by MIS executives.

"There are two different professional types emerging in DP. There is the MBA type who works with the end user, typically an analyst or internal consultant. Then there are the programmers and people who carry out the mundane, unglamorous maintenance tasks. A rift has grown up between the two, leading in some cases to severe communication and management problems," explained Charles Milbourne, applications consultant at Time-Sharing Applications and Consulting Services, Encino, Calif.

MIS departments, Epner added, still do not know how to work with first-time users in the information center. "They are starting to see the beginning of an end-user revolt. The end user is going to outside parties to provide him with services. As this revolt becomes more obvious to MIS managers, they will wake up and start providing support. Until that happens, the information center is not going to serve the purpose for which it was set up, namely to act as an information utility for the company," Epner said.

Specialists in application software, Costello said, will need to get involved with information resource management, fourth-generation languages and data dictionary systems to be able to develop rapidly solid-state applications with a minimum of bugs. The system software specialist, on the other hand, will need to be immersed in data base technology, telecommunications and distributed processing skills, he maintained.

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Revamps Department

Manager Cuts Maintenance Time by 70%

By Jeffry Beeler
CW West Coast Bureau

SAN DIEGO — When Ralph Cook joined the San Diego County Department of Education as DP director about eight years ago, his programmers devoted practically all their time maintaining old programs rather than developing new ones.

"We were about as close to being an 100%-maintenance, 0%-development shop as you can get," the department's DP director recalled.

Even in comparison with the problems at most other commercial information processing centers, where the creation of new systems often accounts for only 10% to 30% of the total programming effort, the maintenance burden at Cook's department was uncommonly heavy.

But today, maintenance requirements no longer rank among his organization's most pressing DP concerns. In striking contrast to many other central computing staffs, Cook's systems personnel allocate at most only 25% to 30% of their total programming time to fixing and updating existing software. Most of the remaining 70% to 75% is channeled into the development of new applications.

For the Department of Education's end users, the computing center's drastic reduction in maintenance demands has meant a sharp upturn in the installation of new automated services. The users have already received new financial accounting and student-information systems, both of which previously existed in only the most rudimentary form. By the end of the current quarter, Cook's staff expects to expand the student-information system even further with the addition of 70 to 100 new user terminals.

Structured Methodology

The startling reduction in the data center's program-maintenance load has resulted primarily from Cook's decision six years ago to convert his organization to structured design and programming techniques.

During his first two years as the Department of Education's DP director, Cook was so preoccupied with his organization's upgrade to a new mainframe that he was unable to devote much energy to the data center's maintenance woes.

But in 1977, after the mainframe conversion was completed, he shifted his attention to the problem of increasing his staff's applications-development activities.

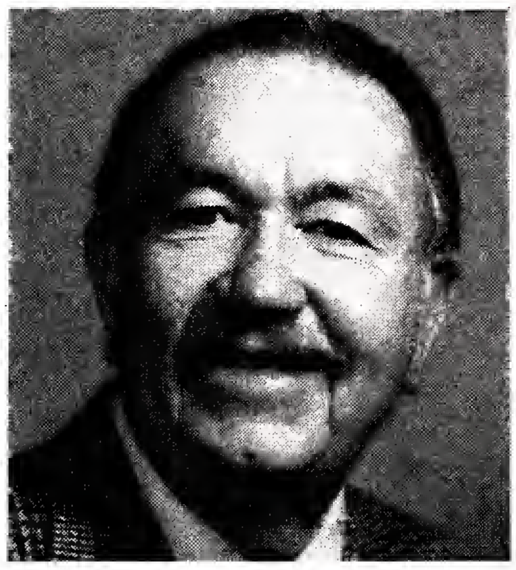
Toward that end, Cook arranged to take a two-week course in structured methodology from Danville, Calif.-based DP consultant Gopal Kapur. The DP director then began putting his newly acquired computing knowledge into practice and eventually presented his employees with an ultimatum: Either accept structured design and programming techniques as a way of professional life or seek employment elsewhere. Cook's demand met with only one dissenting opinion.

Since then, the Department of Education's central computing organization has revamped its applications-development procedures to conform to certain widely accepted industry standards. In essence, the data center's management and staff have broken the systems design and programming process into several readily identifiable phases, including specification review, function review, hierarchical diagramming, pseudo code preparation, compile code writing and testing.

At the end of each development step, Cook requires all participating staff members to submit their work to a structured walk-through. During specification and function review, for example, walk-through participants include nontechnical end users as well as system analysts, programmers and project managers.

But Cook has done much more during his eight-year reign as the Department of Education's DP director than merely introduce his data center staff to structured programming procedures. He has also instituted a program of ongoing DP training.

"When I first arrived here on the scene during the mid-1970s, [our computing department] didn't have a nickel in its budget for training," Cook recalled. "Now, we consider training our single most important expense item. We're willing to cut anywhere in the budget but there."



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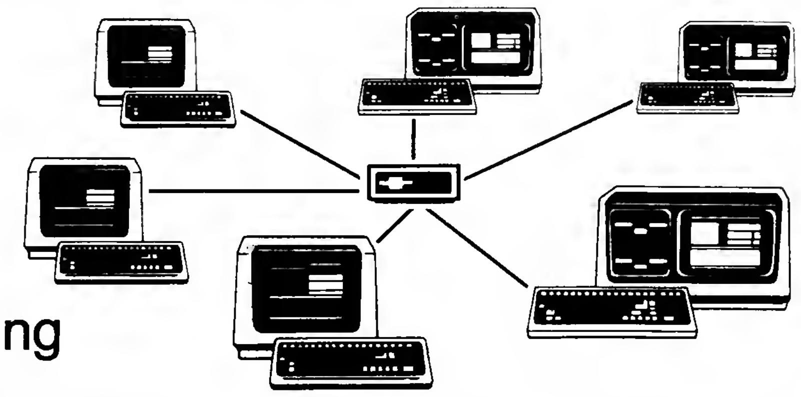

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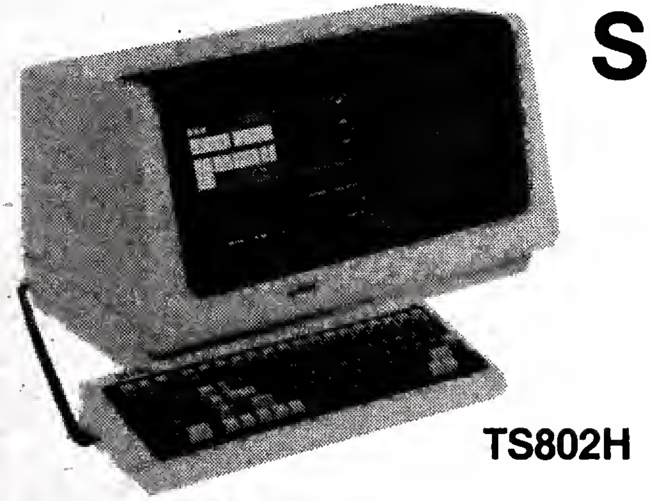

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Survey Finds Data Administration Flourishing

By Lois Paul
CW Staff

BOSTON — Data administration functions are alive and apparently functioning successfully in nearly half of 60 Fortune 1000 firms surveyed recently, but it is difficult to determine exactly what is responsible for their success.

This is one of the findings of Beverly Kahn, an assistant professor of management information systems at Boston University, who conducted a survey of a cross section of large firms.

To learn what was going on in the data administration and data base administration areas, Kahn surveyed 60 firms in the later part of 1982, the bulk of which were in the top 300 of the Fortune 1000. The surveys were targeted toward the data administrator or chief information officer of the organization.

She found that although the majority of the respondents reported that they were at least partially successful in their data administration efforts, it was difficult to determine what they were successful at doing. "I looked at what they had improved and they hadn't improved very much of anything," Kahn said.

Evaluating Effectiveness

The survey asked respondents to evaluate the effectiveness with which a number of data-management-related activities are accomplished in their organizations, such as promoting data sharing and controlling redundancy. Of the 17 activities listed, only maintaining procedures for data restoration and maintaining data integrity were listed by more than 50% of the respondents, according to Kahn.

TYPE OF DA FUNCTION	DBMS EXISTS	USE OF DBMS*			
		1%-25%	26%-50%	51%-70%	71%-100%
DA and DBA	92.3%	37%	29%	20%	12%
DBA Only	100	54	23	23	0
No Formal Function	57.2	63	25	12	0
All	84.6	47	27	20	6

*Only includes organizations with a DBMS based on the percentage of DBMS-based applications.

Source: Boston University

Figure 1

TYPE OF DA FUNCTION	COMPUTERIZED DDS EXISTS	USE OF COMPUTERIZED DDS**		
		1%-25%	26%-50%	51%-70%
DA and DBA	72%	62%	24%	14%
DBA Only	85	91	0	9
No Formal Function*	17	—	—	—
All	62	72	17	11

*Sample size is too small for usage information to be meaningful.
**Of organizations with a DDS.

Source: Boston University

Figure 2

Another question asked how the establishment of a data administration function affected activities such as data sharing and documentation about data. Sixty-eight percent of the respondents indicated that documentation about data was improved. They also reported that the data administration improved consistent information and somewhat improved data sharing. "There was no consensus on the improvement of termination of future requirements or user satisfaction," she said, noting that the same things seemed to be improved within the responding organizations whether they had a data administration and a data base administration or not.

"They weren't effective in promoting data sharing. One of the things that surprised me is they didn't feel they were effective in controlling redundancy. Only 23% felt they were somewhat effective, and 39% felt they weren't effective at all," Kahn said.

"They say that maintaining data integrity is important. Then if you ask them if they have ways of defining integrity constraints or rules for data values, they don't say they do that. So I wonder what they do and how they do it," she added. "The only thing that came out overwhelmingly was procedures for data retention [85%]." The next highest category of data administration/data base administration effectiveness, according to the respondents, was consulting (approximately 40%).

In looking at the changes that have taken place in the data administration function, Kahn focused on data-management-related standards. She was surprised by the relative lack of standards that she found even within organizations with data administration/data base administration functions.

"The interesting thing is that if you are looking at the sample as a whole, the only type of standards that overwhelmingly exist are in program and system documentation. Ninety percent of the companies had documentation standards and recovery standards for disasters," she said, noting that only 60% of the total sample had system life-cycle standards.

Standards Enforced

"If they do exist they seem to be enforced," Kahn added. "So people don't have standards for standards' sake. Or the corollary is that they are afraid to admit that they have standards and don't enforce them."

In terms of the data administration/data base administration function, Kahn learned that this usually has come into being because there was some disaster. "Usually it occured because the first time they tried to integrate something — and the integrated system was to supply top management with information — they found out the integration was impossible," she said.

In most organizations, she said, the data base management system (DBMS) came first, the data base administration function second and the data dictionary system third. She said this followed naturally, because first the software would be installed and when the firm saw this did not solve all of their problems, they would establish an organizational function to work with it. The data dictionary would be added to help use the DBMS. About 40% of the firms she surveyed brought in the data administration function last.

Kahn is using SPSS, Inc.'s Statistical Package for the Social Sciences package, run on Boston University's IBM 3081, for statistical tabulation of her results.

DBMS Plentiful But Not Used: Survey

BOSTON — Although the majority (84%) of 60 firms in a recent survey reported having more than one data base management system (DBMS), they reportedly are not making much use of this software.

"Data base systems are not used; they just exist," according to the surveyer, Beverly Kahn, an assistant professor of management information systems at Boston University. She also found that the firms' planned use of their DBMS packages was not very high. "They were using DBMS, but not necessarily on integrated data," she said.

In contrast, the planned use of data dictionary systems (DDS) was high, she noted. "There is more of a trend toward the dictionaries. I asked what they planned to use and what they felt they should use, and everyone seems to be not as unhappy with their use of DBMS as they were unhappy with their use of DDS."

"People are using primarily conventional files still, regardless of what is going on," Kahn said, noting that 55% of the respondents reported that they are using conventional files either primarily or exclusively. "Hardly anyone is using primarily integrated data bases. No one said they were using totally integrated data bases."

Kahn said a major surprise in this section of the study was the types of DBMS packages she found in multiple-DBMS shops. "When you expect people to have more than one [DBMS], you expect them to have some type of procedural workhorse," she said, citing the combination of IBM's IMS and either IBM's Query by Example or Structured Query Language. Instead, she found combinations such as two hierarchical systems and two Codasyl-type systems in the same shop.

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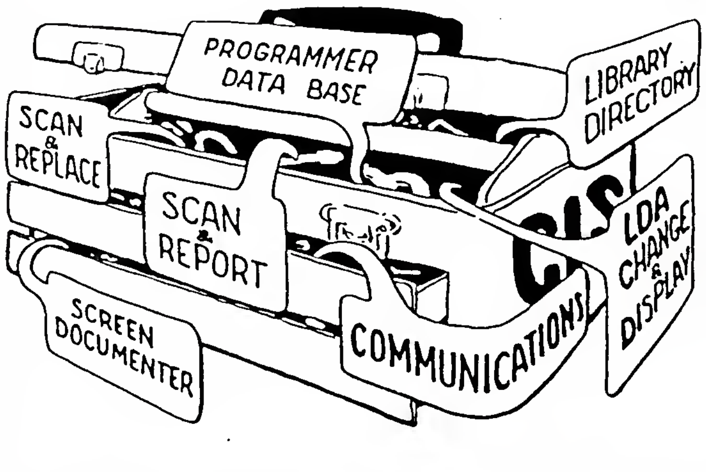

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Software Listing Now Available

DEDHAM, Mass. — The 1983 edition of *Design Compudata*, a software and systems directory, is now available.

The new edition reportedly shows an increase in packages specifically designed for architectural and engineering firms.

Compared with last year's edition, the directory lists fives times as much software for Apple Computer, Inc. equipment, three times as many packages for Radio Shack and Prime Computer, Inc. hardware and twice the number of packages for IBM and Digital Equipment Corp. units, the vendor said.

Design Compudata costs $95, plus $3 for postage and handling.

The edition is available from Frank A. Stasiowski, Publisher, 45 Van Brunt Ave., Dedham, Mass. 02026.

Study Finds CIO Ranks High in Corporation

BOSTON — The Chief Information Officer has finally achieved a level of credibility in most organizations, according to a recent report.

A survey of 60 Fortune 1000 firms by Beverly Kahn, assistant professor of management information systems (MIS) at Boston University, found that, in most cases, the chief information officer was "way up there in the organizational hierarchy."

"In your very large Fortune 200 companies, they were two levels below the president, and in the next size group they were reporting to the president," she said.

In terms of centralization of the MIS function, 65% of the respondents said that 85% or more of MIS activities are largely centralized.

Operational control systems still dominated, with 69% of the organizations reporting they had 80% to 100% transaction-oriented production systems. Kahn also found that 92% of the sample reported they had less than 10% decision support system functions within their MIS departments.

Taking a look at the specific industries represented by the respondents, Kahn was surprised to note that the electronics and electrical industry appeared to be the most progressive in terms of the MIS function.

For example, this group had more data administrators than any other industry as a whole, according to Kahn.

The majority (56%) of the respondents indicated that they have formal MIS planning committees and, of these, only 27% felt that these were really influential.

The only person who overwhelmingly was reported as being involved in the planning committee was the chief information officer.

CW Photo by P. Gillin

Beverly Kahn

PVI Users Group To Meet March 9

BOULDER, Colo. — Precision Visuals, Inc. (PVI) will hold its 1983 users group meeting at the Hilton Harvest House Hotel here March 9-11. The company will also hold a device-independent graphics course March 7-8.

The three-day conference reportedly will include user presentations, explanations by members of the American National Standards Institute Committee on current graphics standards activities and panel discussions on graphics software and hardware trends. Other sessions will include a panel discussion on enhancements and additions to PVI software and a review of graphics hardware for which PVI has written device-driver software.

Also scheduled are several workshops and a demonstration room that reportedly will feature a broad range of graphics devices. Representatives from several major graphics firms are expected to participate in the workshops, a spokesman said.

Conference registration is $100/person; $75/person for additional attendees from the same firm. The fee for the device-independent graphics course is $295. Attendance at both costs $325; $295 for additional attendees from the same firm. Final registration is due Feb. 21. More information is available from Brenda Honeyman, PVI, 6260 Lookout Road, Boulder, Colo. 80301.

Software Grants Target Farming

LINCOLN, Neb. — The Agdisk Educational Foundation is offering grants of microcomputer software totaling $180,000 to help further computer literacy in agriculture.

Agricultural educators, extension agents and industry leaders who work with computerized agricultural operations are encouraged to apply for a grant. As many as 500 grants of microcomputer software, ranging in value from $140 to $1,500, may be awarded.

Special consideration will be given to applicants involved in the following educational areas: farm accounting, budgeting or enterprise analysis, farm grain/livestock profit projections, commodity market analysis, general farm financial management, machinery management, corn and soybean or swine management and record-keeping for swine, crop, dairy or cattle operations.

Applications are available from Scott T. Robertson, General Counsel, Agdisk Educational Foundation, Harris Terminal Systems, 624 Peach St., Lincoln, Neb. 68501.

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Datacomm Briefs

House Report Targets Telecommunications

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — A recent report issued by a House of Representatives Republican task force on regulatory reform puts new telecommunications legislation near the top of its proposed agenda for the incoming 98th Congress. The report also takes a stand on some controversial issues.

For example, it endorses putting intrastate long-distance services, now controlled by state regulatory agencies, under the Federal Communications Commission's (FCC) authority. It also suggests that companies without monopoly power should be allowed to offer international communications services free of regulation.

The FCC, although praised for a number of actions, was criticized for giving half of the recently created cellular mobile radio spectrum to telephone carriers. This action allegedly will reduce the chance of cellular radio becoming a competitive alternative to local telephone carrier facilities. Meanwhile, the commission's order that AT&T must file a Section 214 application for Basic Packet Switching Service could lead to unnecessary regulation, the task force added.

Entitled "Regulatory Reform: The Quiet Revolution," the report, among other recommendations, suggests that Congress prohibit the U.S. Postal Service from "providing competitive service such as [Electronic Computer-Originated Mail]."

A spokesman for Rep. Jerry Lewis (R-Calif.), chairman of the task force, said the report has aroused "great interest" among Republicans in Congress, indicating there is a good chance at least some of the recommendations will be converted into proposed legislation.

FCC Wants More Info On Divestiture Effect

WASHINGTON, D.C. — Before AT&T can divest 22 of its operating companies early next year, the Federal Communications Commission (FCC) wants the company to explain the effect of the divestiture on the introduction of new services.

Under a commission order issued earlier this month, the phone company also must describe any "technical changes" resulting from divestiture; what cost increases are anticipated and how they will be allocated; how the "equal access" provision of the settlement agreement will be applied to AT&T's Long Lines Division and competing long-distance carriers; and the way the "central staff organization" — to be run by seven regional holding companies that will own the 22 Bell operating companies after divestiture — will relate to the latter companies and to other carriers.

The FCC's request stems from the 1934 Communications Act, which states that before regulated communications facilities can change hands, the FCC must determine that the transfer is in the public interest.

Because of the number of facilities involved in the upcoming divestiture, there is some question whether it can be completed by Jan. 1, 1984, the date on which the phone company wants divestiture to occur.

SPCC Files Appeal Of AT&T Suit Result

WASHINGTON, D.C. — Southern Pacific Communications Co. (SPCC) has taken its first antitrust suit against AT&T to the U.S. Court of Appeals here. It has also filed a second suit in San Francisco.

The latter case involves AT&T's alleged attempts to prevent SPCC from marketing Sprint, a competitor to the phone company's long-distance dial-up telephone service.

The first case revolves around charges that AT&T refused to interconnect its local exchange facilities with SPCC private lines before 1979. Last month, Federal District Court Judge Charles Richey absolved AT&T of all charges. But Richey's verdict clashes sharply with the one rendered last summer by a federal district court in Chicago. That case, filed by MCI Communications Corp., involved many of the same complaints at issue in the SPCC antitrust suit. The Chicago jury decided that AT&T had committed multiple violations of the Sherman Antitrust Act and awarded MCI record damages of $1.8 billion plus interest.

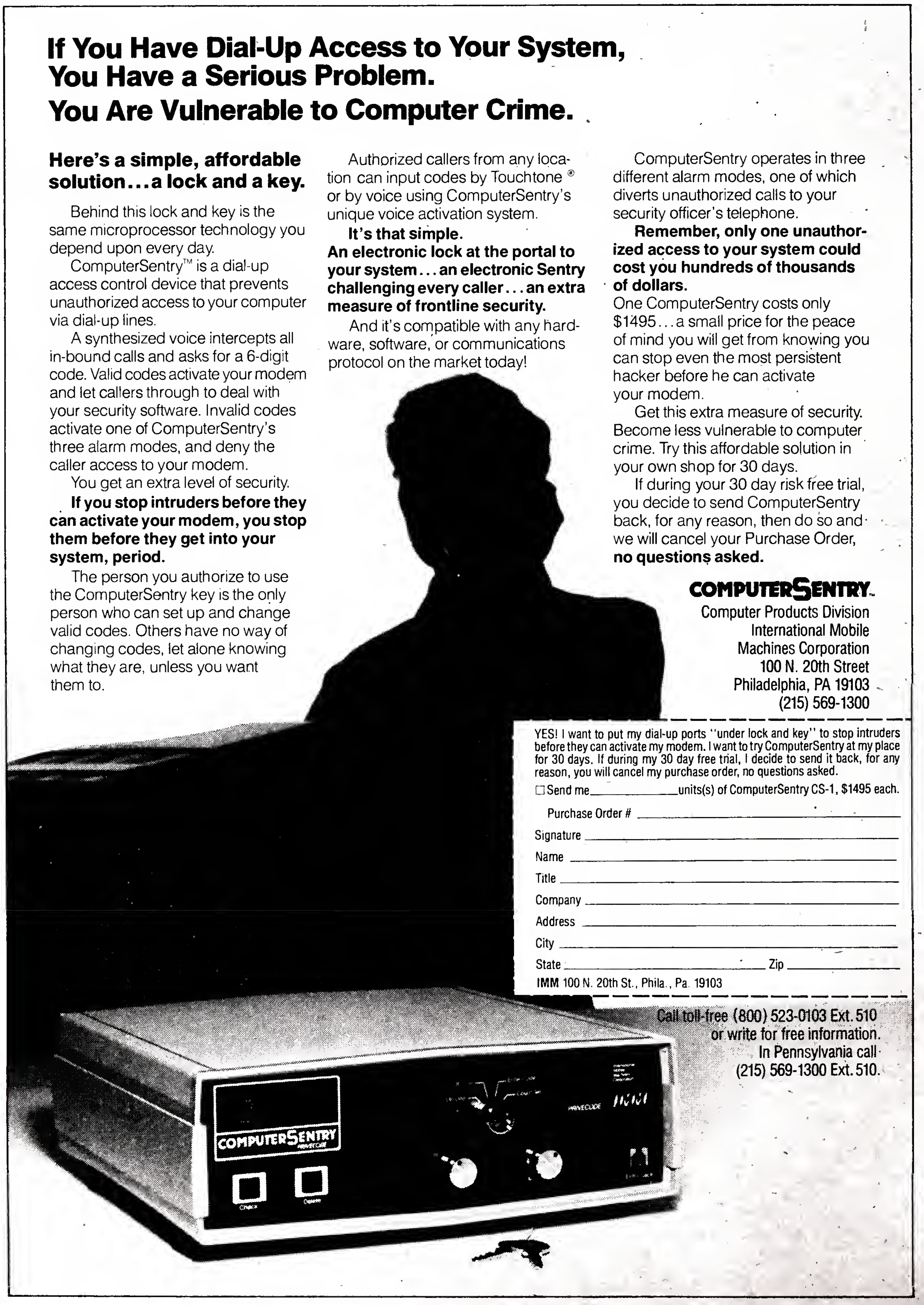
Office Systems Theme of Book

BETHESDA, Md. — The International Micrographic Congress (IMC) is offering *Emerging Office Systems*, a 433-page book on strategies for developing an office system.

The book addresses the pitfalls involved with merging information technologies. A special emphasis is placed on the human and organizational factors involved in implementing an office system.

Included are case studies on why some plans fail and how technologies are misused, IMC said.

The book, designated IMC-121, costs $28 ($36 airmail). It can be ordered from IMC through P.O. Box 34404, Bethesda, Md. 20817.



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Salary Ranges $30,000 to $35,000

Poll Finds QA Analysts Enthusiastic Over Jobs

By Susan Blakeney
CW Staff

ORLANDO, Fla. — The average salary range for data processing quality assurance (QA) analysts is $30,000 to $35,000.

Most QA professionals are enthusiastic about the challenge and opportunity for advancement associated with their jobs.

QA slots are filled almost exclusively by data processing personnel.

Those are the findings of a recent survey conducted by the Quality Assurance Institute, which polled 92 organizations in different businesses around the country.

The survey also found that the average QA function has been organized for less than two years. While this average did not accurately reflect the chronological age of the QA function in computer companies per se (the majority of which said they have had QA for three or more years), it did reveal the trend in the other industries polled, which spanned financial houses, government and education, regulated industries, manufacturing and service companies.

The bulk of the QA staff reports to data processing management other than the manager of systems and programming or computer operations, the survey said. Independence from systems development and operations were cited as important in making the function successful, and most of the QA functions draw their authority from a management directive clearly stating its responsibilities.

Main Function

The main function of QA groups appears to be conducting reviews of applications during the development cycle (see story below). However, in approximately two-thirds of the surveyed organizations, the QA group did not have the authority to halt application development projects.

Roughly 80% of all QA staff is assigned permanently to the DP QA group, the survey found. On the other hand, only one-third of the QA reviews are conducted exclusively by the QA staff. Close to 50% are performed by a combination of a review team, internal auditors and QA staff personnel.

During the review of an application system, the survey revealed, about 33% of the QA staffers conducted their review by probing, 25% used QA-developed checklists, 15% relied on checklists provided in purchased life cycle methodologies and less than 10% used software during the review. The remainder overlapped on the above.

Moreover, one-third of the QA groups were involved in testing program code, and of those who tested, more than two-thirds prepared their own criteria.

Some of the more notable practices used in fulfilling the QA responsibilities are quality circles, peer review, written reports, compliance to standards, professional judgement, mathematical methods.

Average Staffing

In the industries surveyed, the average staffing was approximately one QA analyst for each 40 systems analysts/programmers. The average computer system is apparently subject to three reviews, but in approximately 20% of the companies surveyed, seven or more reviews occur. The average QA analysts works with three or less projects at any one time, the survey reported.

According to the survey, the source of QA personnel is, in descending order of frequency: systems analysts, programmers, computer operations/control personnel. Some 80% of QA managers have six or more years of DP experience, and over 50% of the QA staff has six or more years' DP experience. The average tenure of a QA member is two years or less.

Over 80% of QA personnel have a four-year college degree, while few have any type of certification, according to the poll. The most probable promotion path for a QA manager in more than 50% of the organizations queried was into DP management.

Quality assurance requires skills other than DP, according to survey respondents, and these qualities include interpersonal skills, verbal and written communication competence, time management, knowledge of the business, statistics and accounting experience.

A copy of the survey report is available for $25 from the Quality Assurance Institute at 9222 Bay Point Drive, Orlando, Fla. 32811.

Number of Full-Time Professionals in DP Quality Assurance Function
(By Industry)

Industry Number	DP/Hardware Software	Financial	Government Education	Regulated Industries	Manufacturing Extraction	Trade/ Service/ Leisure
One or Less	18.20%	11.10%	33.30%	19%	47.80%	41.70%
Two to Five	63.60	66.70	50	66.70	43.50	41.70
Six to Ten	9.10	11.10	0	4.80	0	0
Eleven to Fifteen	0	5.50	16.70	0	4.30	8.30
Sixteen or More	9.10	5.50	0	9.50	4.30	8.30
Total	100%	100%	100%	100%	100%	100%
Sample Size	11	18	6	21	23	12

Source: Quality Assurance Institute

Figure 1

Sources for Filling Quality Assurance Vacancies
(By Industry)

	DP/Hardware Software	Financial	Government Education	Regulated Industries	Manufacturing Extraction	Trade/ Service/ Leisure
System Analysts	35.30%	32.40%	35.70%	50%	42.40%	50%
Programmers	29.40	16.20	28.60	18.80	18.20	27.80
Operations/Control	17.60	18.90	14.30	15.60	18.20	16.70
Users	0	5.40	7.10	9.40	3	0
Auditors	0	10.80	0	6.30	3	5.60
Others	17.60	16.20	14.30	0	15.20	0
Total	100%	100%	100%	100%	100%	100%
Total Responses	17	37	14	32	33	18

Source: Quality Assurance Institute

Figure 2

Best Sources of Training for Quality Assurance
(By Industry)

	DP/Hardware Software	Financial	Government Education	Regulated Industries	Manufacturing Extraction	Trade/ Service/ Leisure
Seminar/Workshop	22.20%	33.30%	25%	37.90%	31.40%	11.10%
Conference/Symposium	16.70	18.50	25	20.70	15.70	16.70
Publications	16.70	7.40	12.50	3.40	17.60	22.20
On-Job Training/In House	27.80	22.20	37.50	20.70	19.60	22.20
Other	16.70	18.50	0	17.20	15.70	27.80
Total	100%	100%	100%	100%	100%	100%
Total Responses	18	27	8	29	51	18

Source: Quality Assurance Institute

Figure 3

QA's Main Role Found in System Certification

ORLANDO, Fla. — While the responsibilities of quality assurance (QA) groups vary significantly from industry to industry, the main duty, as well as the most time-consuming one, is certifying systems prior to production status, according to a survey conducted by the Quality Assurance Institute here.

Other quality assurance functions include reviewing and certifying development and documentation; enforcing DP standards; overseeing program code change; reporting hardware/software problems; managing changes to applications; monitoring adherence to security measures; reviewing system design; and assuring system and programming practices are followed.

The cost of a QA review was found to fall between 2% and 5% of the total developmental effort in about 50% of the organizations polled. Of the remainder, half are below 2% and half are above 6%.

The survey indicated that internal audit is generally supportive of the QA function, and in about 10% of the organizations it actually participates on reviews.

The most popular methods of enforcing quality in application systems according to the survey are:

- Control of the production library.
- Control of the source library.
- Control of the project scheduling system.

QA is also beginning to develop tools to assess quality. Approximately 20% of those surveyed use risk analysis, 20% use consultants and about 10% use scoring as a QA tool, the survey found.

Relational Software Renames Self, Boosts Oracle

By Jeffry Beeler

CW West Coast Bureau

SAN FRANCISCO — Relational Software, Inc. has renamed itelf Oracle Corp. and has replaced Oracle Version 2.3 with Version 3.0, which is billed as the first mainframe-oriented data base management system (DBMS) to be transported to the microcomputer arena.

Both the company name change and the product enhancement were announced on Jan. 26, during the joint Automated Office Expo and Software Expo West shows here.

Version 3.0 already operates with all IBM mainframes running under VM/CMS and all members of the Digital Equipment Corp. PDP-11 and VAX minicomputer families, an Oracle official said.

The latest Oracle release also reportedly accommodates the Data General Corp. Eclipse series minis (both the 16- and 32-bit machines) and all Motorola Semiconductor Products, Inc. MC68000-based microcomputers running the Bell Laboratories Unix operating system.

In addition, Version 3.0 will soon be enhanced even further to support IBM mainframes running under MVS, all micros built around the Intel Corp. 8086 and MC68000-based products using operating systems other than Unix, the company official explained.

With Version 2.3, Oracle's support was restricted to the DEC PDP-11 and VAX series members.

The resulting expansion of Oracle's CPU support means that users can now link their microcomputers to central mainframes and thus gain easy access to corporate data bases and programs, the official explained. But at the same time, Version 3.0 can also be run on microcomputers in a strictly stand-alone mode if users choose to apply the relational DBMS in that way.

Compatibility with SQL/DS

Oracle credits Version 3.0 with providing full upward compatibility with SQL/DS, IBM's relational DBMS.

And the latest Oracle release comes with a package of software development productivity tools that include a nonprocedural application generator, nonprocedural report writer and integrated data dictionary, the official said.

Written in the C programming language, only 30 of the DBMS' 2,000 modules need to be changed to transport the product from a mainframe to a typical 16- or 32-bit processor, the official continued.

Like its predecessor, Version 3.0 will also be sold directly to end users, the official added.

The enhanced Oracle DBMS costs $48,000 to $96,000 for IBM mainframes, $24,000 to $48,000 for the VAX series systems, $12,000 to $48,000 for the PDP-11 family members and $600 to $2,000 for MC68000-based microcomputers.

The system is available immediately from Oracle at 3000 Sand Hill Road, Menlo Park, Calif. 94025.

Deltak Course Covers IMS/VS

NAPERVILLE, Ill. — Deltak, Inc. has announced "IMS/VS Data Base Concepts and Facilities," a course for applications programmers and programmer/analysts who need to learn more about IBM's DL/1 language for the IBM IMS/VS data base management system. The course is a multimedia course consisting of audio and video tapes as well as text.

The course has no formal prerequisites other than an understanding of basic programming concepts. The course is aimed at familiarizing students with the IMS data base and data communications terminology. Students will be able to discriminate between different views of IMS data and properly arrange events in IMS message processing, the firm said.

The course costs $1,750. It can also be leased for $50/mo to $125/mo, depending on volume. Deltak is located at 1751 W. Diehl Road, Naperville, Ill. 60566.

AMS Meet Set For May 15-18

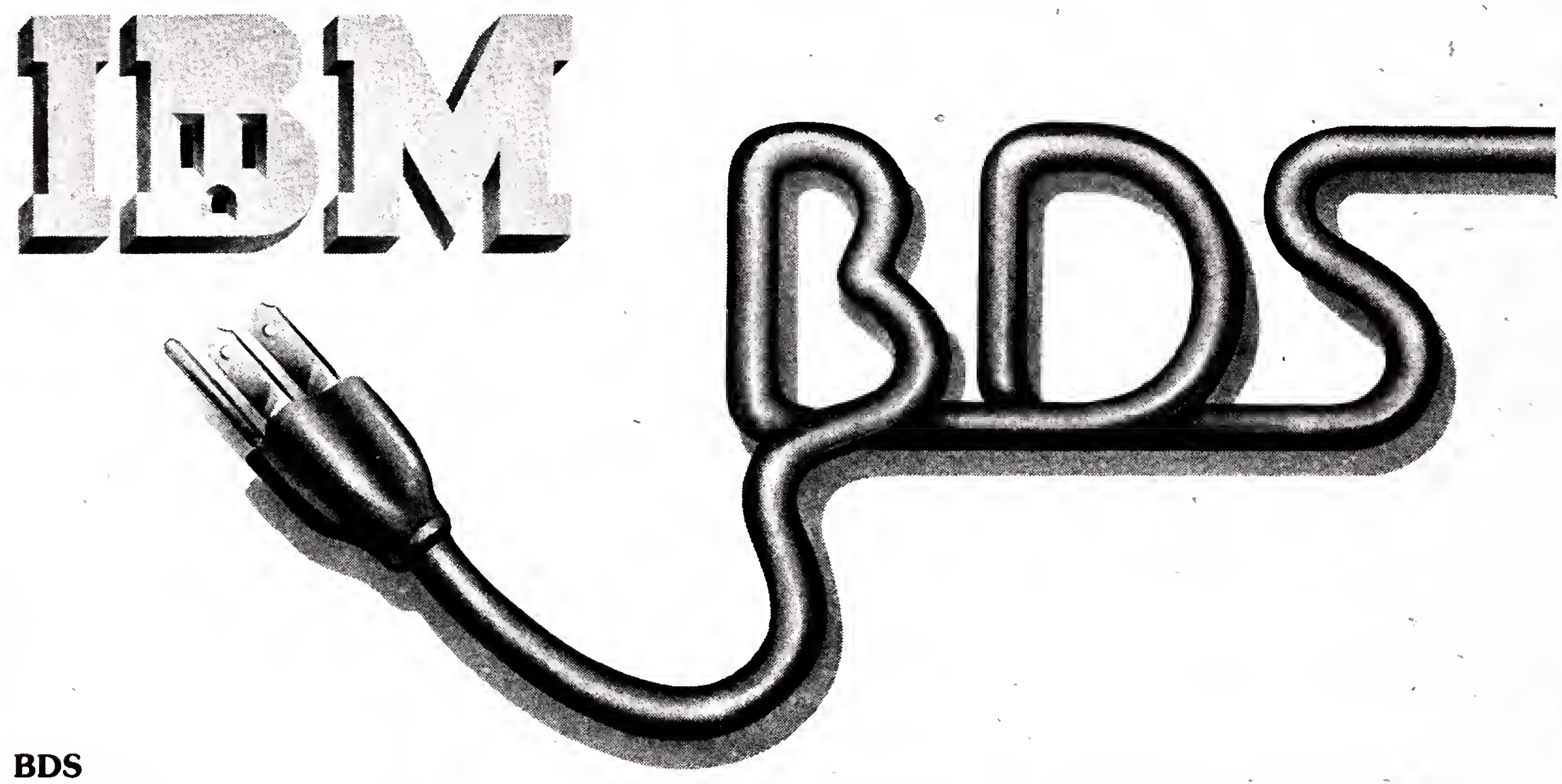
TORONTO — Japan's soaring productivity rate will be compared with the lagging U.S. rate at the 64th international conference of the Administrative Management Society (AMS) here May 15-18.

Dr. William G. Ouchi, management professor at the University of California at Los Angeles' Graduate School of Business, and B. Bruce-Briggs of the Hudson Institute will be the featured speakers at the AMS conference.

The conference is to be held at the Toronto Hilton Harbour Castle Hotel and will deal with such topics as increasing white-collar productivity, implementing automated office systems and managing in tough economic times.

For the full conference, members will pay $250 and nonmembers, $300.

For one day, members pay $165 and nonmembers pay $185. AMS is located at 2360 Maryland Road, Willow Grove, Pa. 19090.



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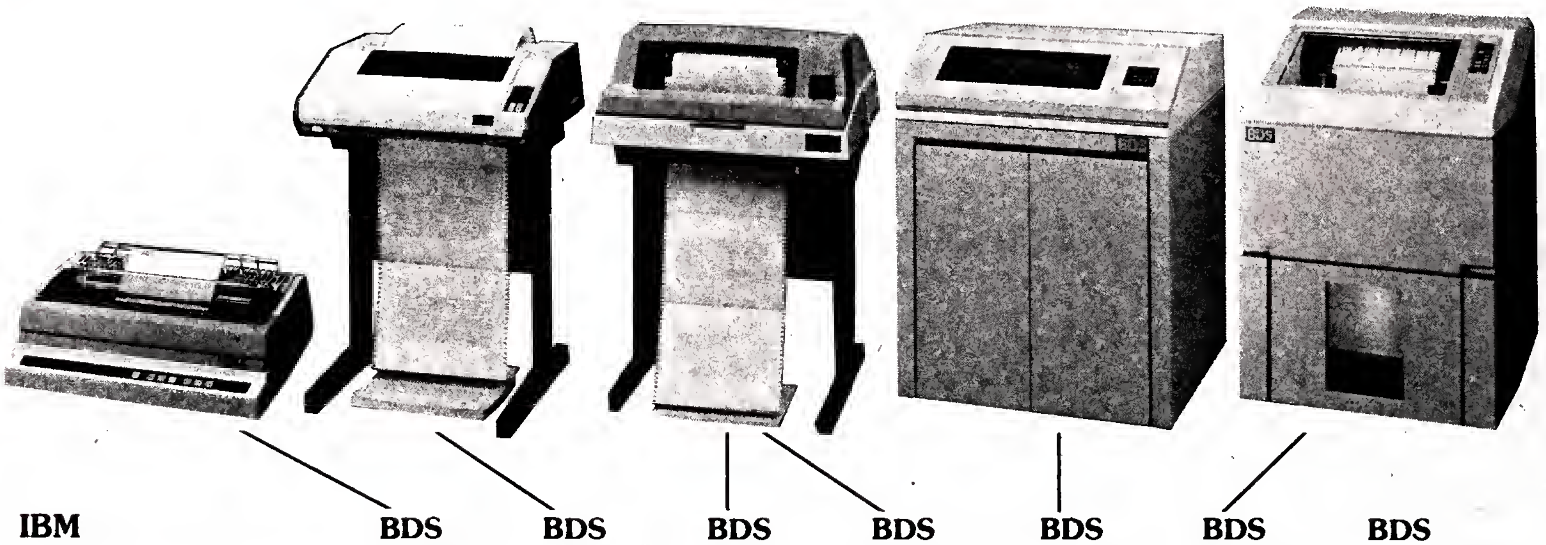

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Futurist Cites Japan's Diligence

U.S. Not Alone in Software Expertise: Futurist

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — The widespread belief that Americans hold a significant edge over the Japanese in software expertise came under fire here last week at a high-technology trade show.

Author and industry futurist Charles P. Lecht disputed the comforting notion that Japan, despite its acknowledged leadership in hardware, still trails the U.S. badly in its ability to produce quality programs.

"The Japanese aren't behind us in programming," Lecht said during his keynote address last week at the joint Automated Office Expo and Software Expo West shows. "Software development is hard everywhere, but the Japanese are the only ones who are saying so."

Lecht — who heads his own New York-based consulting company, Lecht Sciences, Inc. — also challenged the popular American view that Japan acquired most of its current computing expertise by copying or swiping technology from the U.S.

"Japan's success in the computer industry is due, not to theft or imitation of American technology, but to diligence, hard work and honesty," he said. "Japan's success was created by the Japanese themselves, who have dignified the Protestant ethic better than any Protestant ever has."

As if to underscore his point, Lecht cited recent reports that Japanese electronics vendor Nippon Electric Co. plans to shoot a fully automated chip-producing factory into Earth orbit by 1987. The satellite, which will be manned entirely by robots, will exploit the weightlessness and near-vacuum of outer space to make semiconductors with exotic electronic properties that would be impossible to reproduce on the planet's surface.

Announcement of the proposed chip-manufacturing satellite has received heavy press coverage overseas, but for unknown reasons it has yet to be widely publicized in the U.S., he said.

In related comments, Lecht rejected the common U.S. perception that the Soviet Union, like Japan, depends heavily on theft for much of its technological advancement. "The Soviets neither want nor need our technology," he said. "Their only interest in it is to find out how our warheads work."

Lecht Predicts 'Peanut' Micro

SAN FRANCISCO — A forthcoming announcement of a very low-cost IBM microcomputer was among possibilities posed by keynoter Charles Lecht during the Automated Office Expo and Software Expo West here.

Reportedly code named "Peanut," the micro is expected to sell for about $800.

Likely to make its debut sometime during the "very near future," the system will be built around a microprocessor "so small that you won't be able to take it home with you because you wouldn't be able to find it on the shelf," he said.

Lecht also predicted the eventual accretion of the U.S.' existing DP resources into a dozen or so extremely massive computing systems, each of which will be associated with its own set of nested communications networks.

The emergence of these mammoth computing systems in no way will mean the end of today's discrete data centers, which will continue to exist in their current form for some time to come.

Although data centers will continue to do a portion of their processing locally, primarily through function-specific terminals, most of their computing services will come to them from the outside through a massive hierarchy of networks, Lecht predicted.

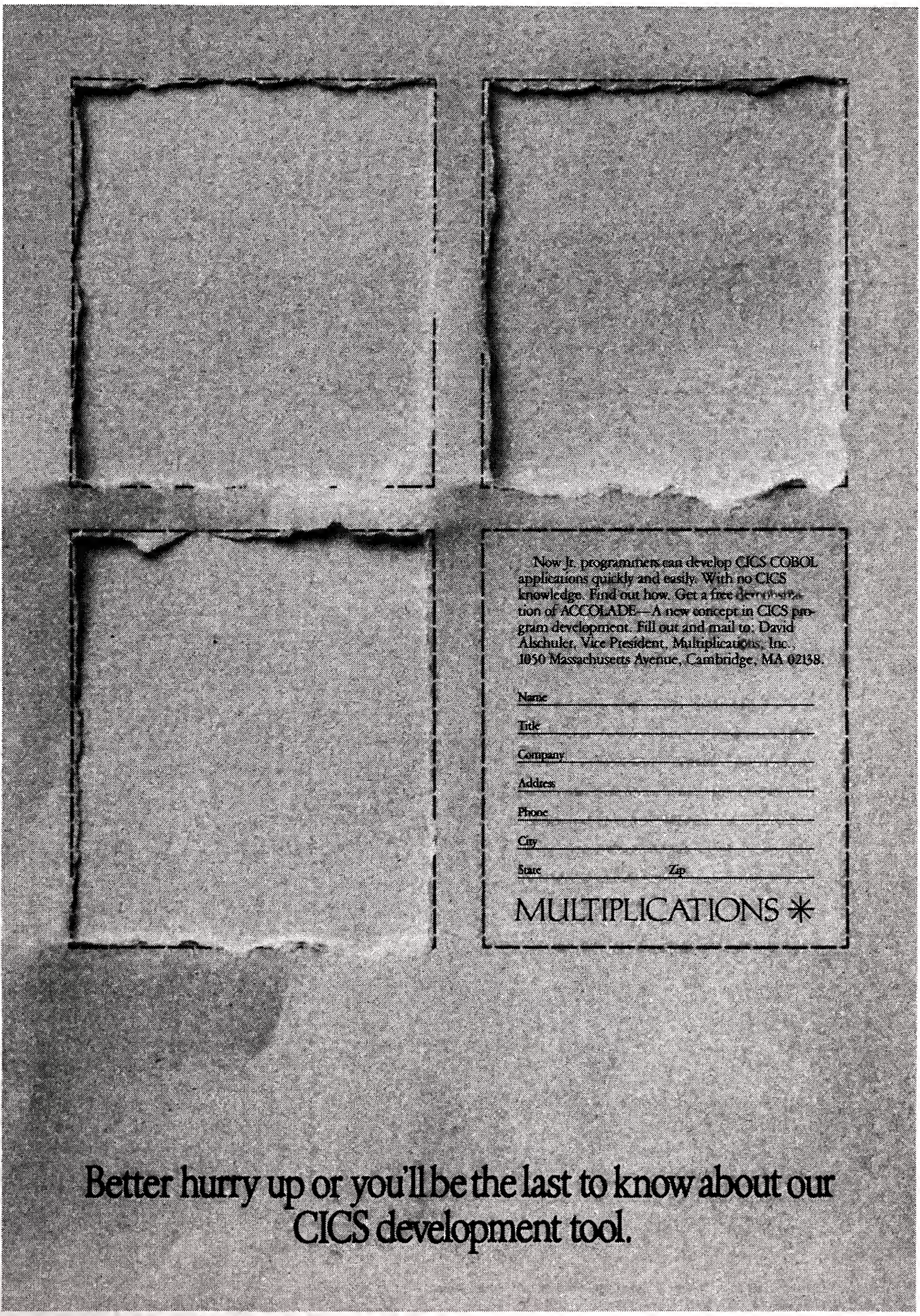
Within five years, he added, most of the companies now involved in supplying DP products or services will cease to exist in their current form. Instead, they will either be absorbed by large national networks or will form independent networks of their own.

Insurers' Booklet Reissued for DPers

DALLAS — International Risk Management Institute, Inc. has announced the second edition of its booklet to aid data processing professionals in evaluating the soundness of their insurance programs.

Entitled "An Insurance Buyers' Checklist for Data Processors," the publication sets forth guidelines, questions to be asked of the insurance agent and points to consider in determining whether an insurance program is properly structured. A risk control checklist aids in determining insurable values for DP equipment.

The booklet costs $15 from the vendor at Suite 208, Building III, 10300 N. Central Expwy., Dallas,



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Bank Users Group Gets Apple's Micro Outlook

By Bruce Hoard
CW Staff

NEW YORK — Members of the Chase Manhattan Bank Personal Computer Users Group listened intently as Apple Computer, Inc.'s John Couch detailed his firm's outlook on personal computing, one of a number of talks held at the group's quarterly meetings.

While not all of the group's members have personal computers, and some know very little about them, all of them share a common interest in micros, according to Irving M. Brown, manager of Chase's three-person Microcomputer Support Group and a driving force behind the users group.

Established last June, the users group — which now boasts some 200 members — has provided a focal point for the burgeoning use of personal computers at one of the world's largest banks.

It was founded by the bank's Corporate Systems Division after the division detected a need and there was a "groundswell" of demand from the Chase community, Brown said. Corporate Systems is responsible for the initiation and support of information technology strategies.

CW Photo by B. Hoard

Irving M. Brown

Brown joined Chase Manhattan nine months ago, bringing with him 18 years of diverse DP experience ranging from programming to consulting. "I came here with the idea of heading this support team and taking advantage of my background to make sure micros would not be in isolation," he said following the meeting.

The users group is guided by Brown and Ralph Verdino, manager of End User Services within the Microcomputer Support Group. Together, they preside over a steering council and a series of special interest groups covering such topics as micro-mainframe interfacing, data base management systems, graphics and local-area networks.

The group also acts as a clearinghouse for hardware and software swaps. If one member has outgrown his system, he can pass it on to another who can still make good use of it. Users may also borrow systems and peripherals.

Brown said the typical users group member falls into one of two categories: systems profesional or non-DP professional end user. "We're not strictly a DP organization," he declared. "Our thrust is very heavily toward the non-DP user." The highest ranking bank official members are from the division executive level, he added.

The personal computer acquisition process at Chase Manhattan is illustrative of the bank's approach to micros. While other large corporations have chosen to establish information centers and in-house computer stores, Brown's three-person Microcomputer Support Group — consisting of himself, Verdino and aid Diane Steiglianese — takes a slightly more informal approach.

All micro requests are funneled through them. If there is a legitimate need, Brown will help the new user configure a system and recommend that the bank's Contracts Administration Department provide it. The cost is charged back to the employee's department.

As Brown noted, most requests lead to acquisitions, and usually quick ones. "It is governed to an extent by how knowledgeable the user is and how well defined his business requirements are," he explained.

There are currently about 300 personal computers in use at Chase, he said, adding most are from Apple and IBM with a smattering from such other vendors as Digital Equipment Corp. and Vector Graphics, Inc. He does not want to add other machines unless they fulfill a specific, needed business function.

The issues that concern user group members can also be broken down into two categories. The "strategic" area includes such problems as compatibility and communications, while the second area deals more with daily problems such as how to perform specific tasks, he said. The most commonly used application is the electronic spreadsheet.

The micro-to-mainframe link has been a hot topic among many personal computer users lately. Brown referred to it as "a growing area," adding, "We definitely want to move into that much more than we have." He said it has come into prominence as the first generation of stand-alone personal computers has given way to the more project-oriented second generation.

Apple's Couch Offers Glimpse Of Lisa, Macintosh Offerings

NEW YORK — At last week's quarterly meeting here, members of the Chase Manhattan Bank Personal Computer Users Group were among the first to catch a glimpse of Apple Computer, Inc.'s future product plans.

John Couch, the vice-president and general manager of Apple's Personal Office Systems Division, talked about Lisa, the firm's recently announced [CW, Jan. 24] 16-bit microcomputer, and also discussed Macintosh, the putative and as yet unannounced successor to Lisa.

Couch said Apple expects 50% of its first-year Lisa sales to come from medium-size ($5 million to $120 million in annual sales) companies.

Fifty Lisas have been sent out to third-party software houses for business software development, he said, adding, "I would expect to see accounting software available within the year."

Apple is setting up 125 Lisa beta test sites this February. The sites are not being established to test Lisa's technical competence; the idea is to test Apple's ability to install and support a large number of the machines, Couch explained.

Turning to Macintosh, the vice-president said it will be less expensive and have less memory than Lisa. It will also lack the "software slots" that allow Lisa to facilitate third-party software packages, he added.

All of Apple's new products over the next five to 10 years will be "flavored" by the Lisa software architecture, Couch noted.

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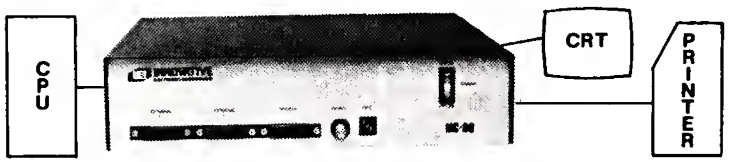

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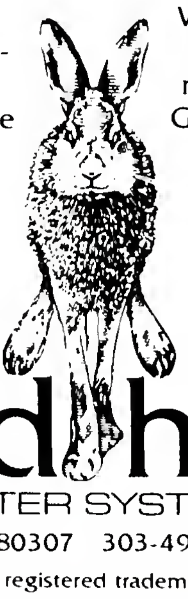

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Congressmen Suspicious

AT&T Squaring Off in BOC Detariffing Battle

By Phil Hirsch
CW Washington Bureau

WASHINGTON — A hot battle was brewing here last week over the detariffing of in-place terminal equipment leased or rented from the Bell operating companies.

AT&T wants this equipment detariffed before next Jan. 1, the planned date for divestiture of 22 Bell operating companies, claiming this plan would mean significant savings for users. But seven influential congressmen have sent a letter to the Federal Communications Commission (FCC) suggesting that AT&T's real interest is making a bundle for itself.

On Jan. 21, the phone company asked the FCC to let it add $6.6 billion to the capitalization of American Bell, Inc., AT&T's deregulated subsidiary. This money would buy the installed, "embedded" base of terminal customer premises equipment now owned by the Bell operating companies. AT&T's plan includes a timetable for transferring the embedded base to American Bell. Dimension, Horizon, Dataphone II and all other "stored program control" customer premises equipment would change hands between Aug. 1 and Dec. 31.

Key Argument

The phone company's key argument is that if the FCC detariffs customer premises equipment after divestiture, rather than before, the installed base will have to be transferred to AT&T rather than American Bell since the latter organization is allowed by the FCC's Second Computer Inquiry decision to offer only unregulated services. According to AT&T Vice-President James R. Billingsley, AT&T "would have to get tariffs for embedded customer premises equipment filed and approved in all 50 regulatory jurisdictions, as well as develop computer systems for billing and accounting under the differing requirements of these jurisdictions. Literally hundreds of millions of dollars would have to be spent."

The seven congressmen argued that "fast track" deregulation would "not permit sufficient time for development of adequate alternative sources of equipment" able to "provide a competitive check on AT&T's prices." In addition, AT&T could "capitalize on its dominance of the installed terminal equipment market and migrate current Bell customers to newer equipment — a strategy which several state public utility commissions have already recognized and opposed."

These comments were in a letter sent to FCC Chairman Mark Fowler Jan. 17. The signers included the chairman of the House of Representatives' Commerce Committee, Rep. John Dingell (D-Mich.); the chairman of the House Telecommunications Subcommittee, Tim Wirth (D-Colo.); and five other subcommittee Democrats — James Scheuer (N.Y.); Al Swift (Wash.); Edward J. Markey (Mass.); W.J. Tauzin (la.); and Henry A. Waxman (Calif.).

They favor procedures that "gradually remove embedded equipment from regulation," for example, "a policy of detariffing equipment, once it has been fully depreciated, or a time curtain set sufficiently far into the future to obviate our concerns."

AT&T has said that if its embedded customer premises equipment deregulation plan is implemented, "American Bell will limit increases in purchase prices for embedded consumer products to the percentage increase in the consumer price index, unless there are unforeseen cost increases." However, a spokeswoman for the Telecommunications Subcommittee pointed out that this guarantee does not include charges for maintenance or other terminal support.

Meet to Cover Software Costs

TORRANCE, Calif. — The Education Foundation of the Data Processing Management Association (EFDPMA) will sponsor a seminar, "Estimating Software Costs," at three locations: March 10-11 in Boston, March 14-15 in Washington, D.C., and March 28-29 in Orlando, Fla.

The program features Dr. Robert C. Tausworthe, software chief engineer of Deep Space Network Digital Systems and the former deputy software manager of the Galileo Project at National Aeronautics and Space Administration's Jet Propulsion Laboratory. He will offer guidelines for critically evaluating the existing methods and costs estimation models and for setting up an effective life-cycle cost information system.

Registration fees are $475 for nonmembers, $455 for association members and $410 for teams of three or more attendees from government, military or university facilities. More information is available from EFDPMA Seminars, Department ESC, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

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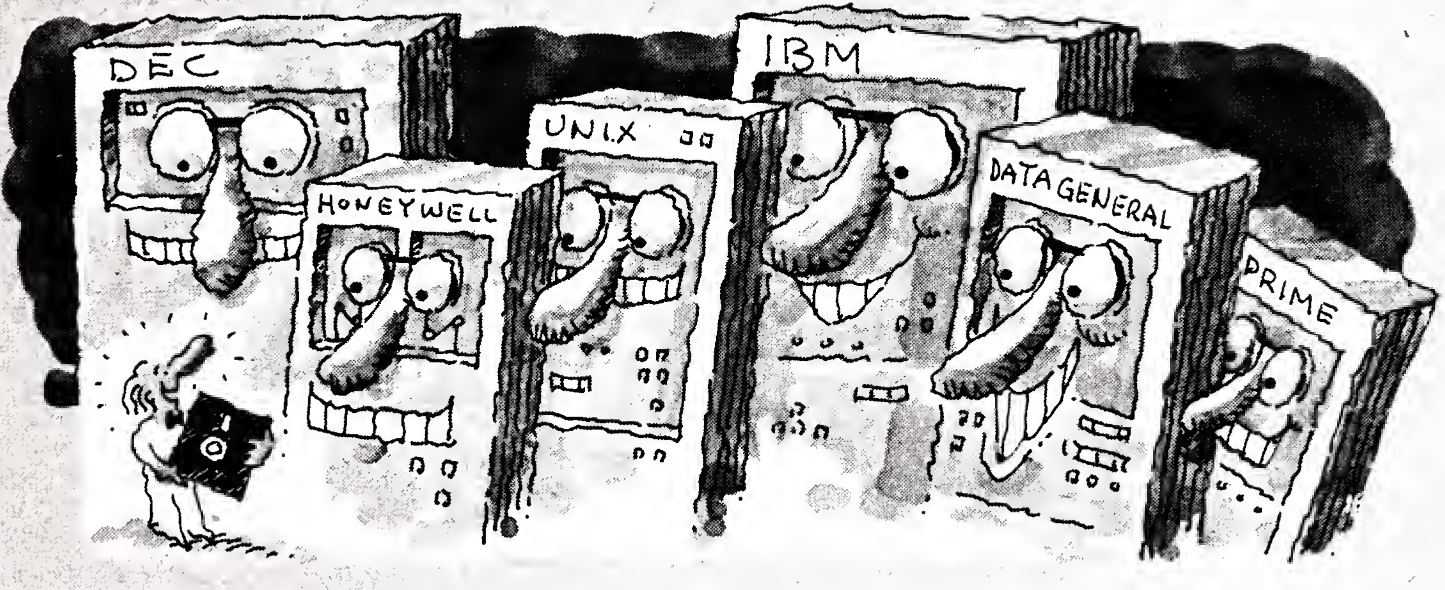

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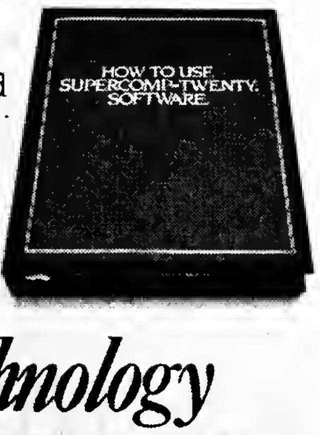

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AT&T Insists BPSS 'Basic,' Not 'Enhanced'

By Phil Hirsch
CW Washington Bureau

Analysis

WASHINGTON, D.C. — Ma Bell struck back at her tormentors, insisting that despite what they say, Basic Packet Switching Service (BPSS) is "basic," rather than "enhanced," as those terms are defined in the Federal Communications Commission's Second Computer Inquiry Decision.

It is an important question for users because BPSS is part of the underpinning for AIS/Net 1000, the smart network service recently unveiled by American Bell, Inc., the phone company's deregulated subsidiary.

Just exactly when that service goes on the air will be determined partly by how soon the BPSS battle is settled.

Also, if BPSS, as proposed by American Bell, is authorized by the FCC, there is at least a chance this will reduce competition among suppliers of enhanced — that is, computer-based communications processing and computer-based information processing — services.

The real issue in the BPSS battle is a matter of market position rather than semantics.

The Computer II decision states that if AT&T wants to offer an enhanced service, it must do so through a fully separated, deregulated subsidiary, such as American Bell. A "basic" service, however, can be offered by AT&T Long Lines, a regulated carrier.

Competitors fear that if the commission decides BPSS is basic, it will put them under a tremendous handicap, for then AT&T allegedly will be able to cross-subsidize the new offering with revenue earned from its long-distance telephone business and set a precedent for doing likewise with future smart network services.

If BPSS is found to be enhanced, AT&T's present plans for offering the new service and, possibly, AIS/Net 1000, will be delayed, giving the competitors more time to anchor themselves in the smart network market.

In its latest comment, AT&T insisted that most of the objections to BPSS are based on misreading the FCC's Computer II decision.

For example, GTE Telenet Communications Corp. had argued that BPSS is enhanced even though it supports a single end-to-end communications protocol, because that protocol "offers the user a range of protocol conversion features which are the very essence of 'enhanced' service."

AT&T's answer was that "the Second Computer Inquiry Decision did not restrict the complexity of protocols that can be supported by basic services. It simply held that a service is basic if customer data exits a carrier network on the same protocol it enters . . . BPSS conforms with this basic service definition."

Channel Service Unit

Another major objection to BPSS is that it requires the customer to interface his terminal to the BPSS access line through a "channel service unit" (CSU), which must be obtained from AT&T.

The phone company, in its latest pronouncement on BPSS, said the CSU complaint has been addressed previously in other proceedings and is unrelated to this one.

The gist of the comments that are said to address the issue is that the CSU enables AT&T to test the user's channel and perform other chores essential to providing network-based services; because these services are essential, independently made CSUs cannot be allowed.

The Independent Data Communications Manufacturers Association, a trade group representing many of the nation's major modem manufacturers, is leading the attack on the CSU.

AT&T's insistence on being the exclusive supplier "denies users an opportunity to select the equipment that best suits their needs and denies independent manufacturers an opportunity to market their products," the association told the commission recently.

Last Summer's Decision

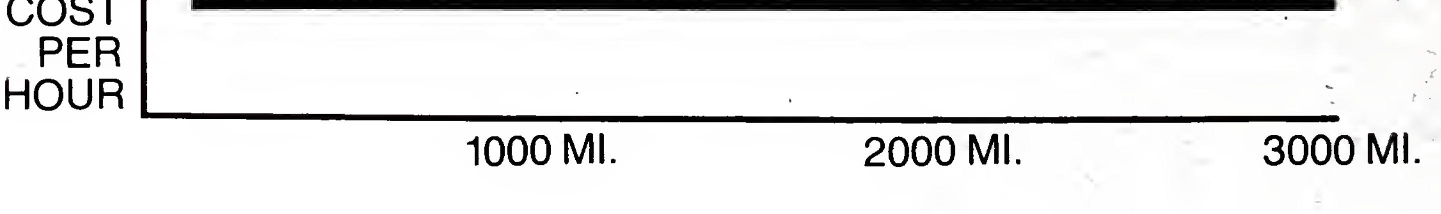
At the moment, it appears the FCC agrees with AT&T that BPSS is a basic service.

Last summer, the commission rejected the initial filing on procedural grounds, but in the process said that "there is no question that Computer II permits AT&T to offer a packet switching service such as BPSS in the network as a basic service."

Subsequently, the phone company removed the commission's procedural objections by filing a Section 214 application, requesting authorization of the service, before submitting a tariff. The comments submitted recently by AT&T, GTE Telenet and other competitors are aimed at influencing the FCC's decision to accept, modify or deny this application.

The commission is also considering separately whether AT&T should be the sole provider of "network channel terminating equipment"; the CSU is one such piece of equipment.

Which transmission line would you follow?



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Automation Seen Reducing Workers' Control

By Marguerite Zientara
CW Staff

CAMBRIDGE, Mass. — Computer systems in the work place tend to force managers' productivity criteria on employees, reinforcing biases against employees and making those biases more unchallengeable than ever, a Harvard Business School professor maintains.

In addition, according to Shoshana Zuboff, assistant professor of organizational behavior and human resource management, as paper documents and other tangibles are replaced by CRT images, work becomes more abstract and some workers find it more difficult to make decisions (see story below).

On the other hand, Zuboff contended, "For some jobs the word 'decision' no longer implies an act of human judgment, but an information processing activity that occurs according to rules embedded in a computer program."

Zuboff's conclusions were drawn from interviews with about 200 employees, supervisors, professionals and managers from organizations in three countries "to discover how people at distinct organizational levels respond to their work when it has been fundamentally reorganized by information technology." In the September-October 1982 issue of the *Harvard Business Review,* Zuboff wrote: "Partly by limiting a collector's discretion regarding how or in what order he or she should work on an account, an automated collection system makes it possible to increase production goals and reduce the time spent on each account" — a perfect example of management bias.

"Thus, for that activity the key to revenue generation becomes volume instead of collection skills," she wrote, adding that collection managers she interviewed "believe that the [automated] system enables them to recoup more funds while reducing their dependence on skilled collectors."

Zuboff described one company's automation of its collection function. When management wanted to design its automated collection system, it sought the ideas of "Bill Smith," who had managed collection activities for 30 years. The designers spent many hours picking Smith's brain and he helped them make many key design decisions. As one member of senior management put it, "We tried to build Bill Smith's brain into the computer. If we did not build it into the system, we might lose to the competition."

Smith's comments made clear some of the reasons the system eliminated most discretion from the job: "I like to see people work. I'm a good worker. I don't like to see people take time off. I don't do it."

But Smith's attitudes turned out to be costly. "A year after the system was in place, turnover had reached almost 100%, and the corporate personnel and employee counseling offices were swamped with complaints from replacements," Zuboff wrote.

"In the process of automating these jobs," Zuboff explained in a recent telephone interview, "[Smith] designed them with a model in mind that meant that the best design demanded the least skill on the part of the collector, where the most skill could be built into the processing of the machine.

"Smith took a job that was rich in skills, in opportunities for judgment, in opportunities for entrepreneurialism and created a set of jobs that were low in those same attributes. Meanwhile, these people had been collectors for years and had excelled in collecting precisely because they had these characteristics of skill, judgment and entrepreneurialism."

The skilled workers "found the jobs abominable once they were automated," Zuboff said. "They felt that the competence that they had developed over a number of years — what made them good collectors — was no longer relevant to the job."

While management could get away with less skilled, less expensive workers in the automated system, Zuboff said, "In practice, that turned out to be a pretty costly strategy, because [they] got people in there working these jobs who didn't care about them very much, who were not well-educated, who created all sorts of discipline problems and who didn't have much of a commitment to the job."

Blame It on Automation

CAMBRIDGE, Mass. — Feelings of frustration, loss of control and difficulty in making decisions can result from job automation when manual work suddenly becomes abstract.

In contrast with a potter's tactile sensations or a clerical worker's paper and pencil that put him "in touch" with his tasks, "with computer-mediated work, employees get feedback about the task object only as symbols through the medium of the information system," according to Harvard Business School Prof. Shoshana Zuboff.

"Very often, from the point of view of the worker," Zuboff wrote in the September-October 1982 issue of the *Harvard Business Review,* "the object of the task seems to have disappeared 'behind the screen' and into the information system."

In interviews with 200 employees in three countries, Zuboff said, "many employees I spoke to reported feeling frustrated because in losing a direct experience of their task it becomes more difficult to exercise judgment over it. In routine jobs, judgment often becomes lodged in the system itself.

"As one bill collector said: 'In our old system, come the end of the month, you knew what you were faced with. With the automated system, you don't know how to get in there to get certain accounts out. You have to work the way the system wants you to.' "

In complex jobs, too, people can lose direct experience of their tasks, she said. The comptroller of a bank that was automating commented, "People become more technical and sophisticated, but they have an inferior understanding of the banking business. New people become like systems people and can program instructions that don't necessarily reflect the spirit of the operation."

Feelings of frustration and loss of control were found to have been remedied somewhat in one instance at a bank branch by the maintenance of a manual card file system, which was supposed to have been replaced by the computer. When senior management questioned the need for such a manual system, the bank branch manager and his staff insisted

(Continued on Page 18)

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Robotics Center Established

BETHLEHEM, Pa. — The Institute for Robotics has recently been established here at Lehigh University under the direction of Dr. Roger Nagel.

The interdisciplinary center will reportedly provide universitywide access to robotics engineering and technology. It will also cultivate and coordinate the development of new and existing graduate and undergraduate programs as well as research activity focused on robotics.

Prior to joining the institute, Nagel worked as computer-aided design and manufacturing integration group leader at the National Bureau of Standards and most recently as corporate manager of automation technology at International Harvester, Inc.

The institute is located at Lehigh University, 436 Brodhead Ave., Bethlehem, Pa. 18015.

MIT to Offer Course on OA

CAMBRIDGE, Mass. — MIT's Laboratory of Computer Science has announced a short course on "Integrated Office Systems: Software Architecture for Friendly Interfaces." The course is scheduled to run from June 27 to July 1 at the school's main campus.

Taught by Dr. Irene Greif and Dr. Marvin Sirbu, the course will present an approach to the design of user-friendly office systems. A variety of office system modules will be described as part of the course.

Attendance at the course costs $1,000. More information is available from the Director of the Summer Session, E19-356, MIT, Cambridge, Mass. 02139.

Automation Seen as Culprit

(Continued from Page 17)

they needed backup.

"The real reason came out," Zuboff reported, "when the branch manager made the following comment: 'You need something you can put your hands on. How else can we be sure of what we are doing?' "

How can management address these problems? It should "think through what kind of employment relationship it wants, what its ideas about human motivation are, what the expectations of the employees are and what sorts of visions of management, supervision and discipline management is implicitly or explicitly harboring," Zuboff suggested in a recent interview.

"The demands for a thoughtful and energetic management response go deeper than the need for a 'friendly interface' or 'user involvement,' " she pointed out in her article. "The underlying nature of this technology requires understanding; the habitual assumptions used in its design must surface.

"Managers' ability to meet these demands will be an important determinant of the quality of work in future organizations."

Color Graphics Conference Slated For March 10 in Tallahassee

TALLAHASSEE, Fla. — The 1983 International Computer Color Graphics Conference will be held here March 10-12. Over 2,000 attendees are expected to attend sessions at the Florida State Conference Center and Tallahassee/Leon County Civic Center.

The conference will explore four major application areas: arts and humanities, communications, facilities and resource management and medical sciences. Current applications and new findings in computer color graphics will be examined.

Speakers will include Dr. Robert Aangeenbrug, president of the National Computer Graphics Association and professor of geography, University of Kansas; and Dr. Thomas DeFanti, chairman of the Association for Computing Machinery's Special Interest Group on Computer Graphics.

Among others, the conference is cosponsored by Florida State University, Florida A&M University and the International Institute for Creative Communication at Florida International University.

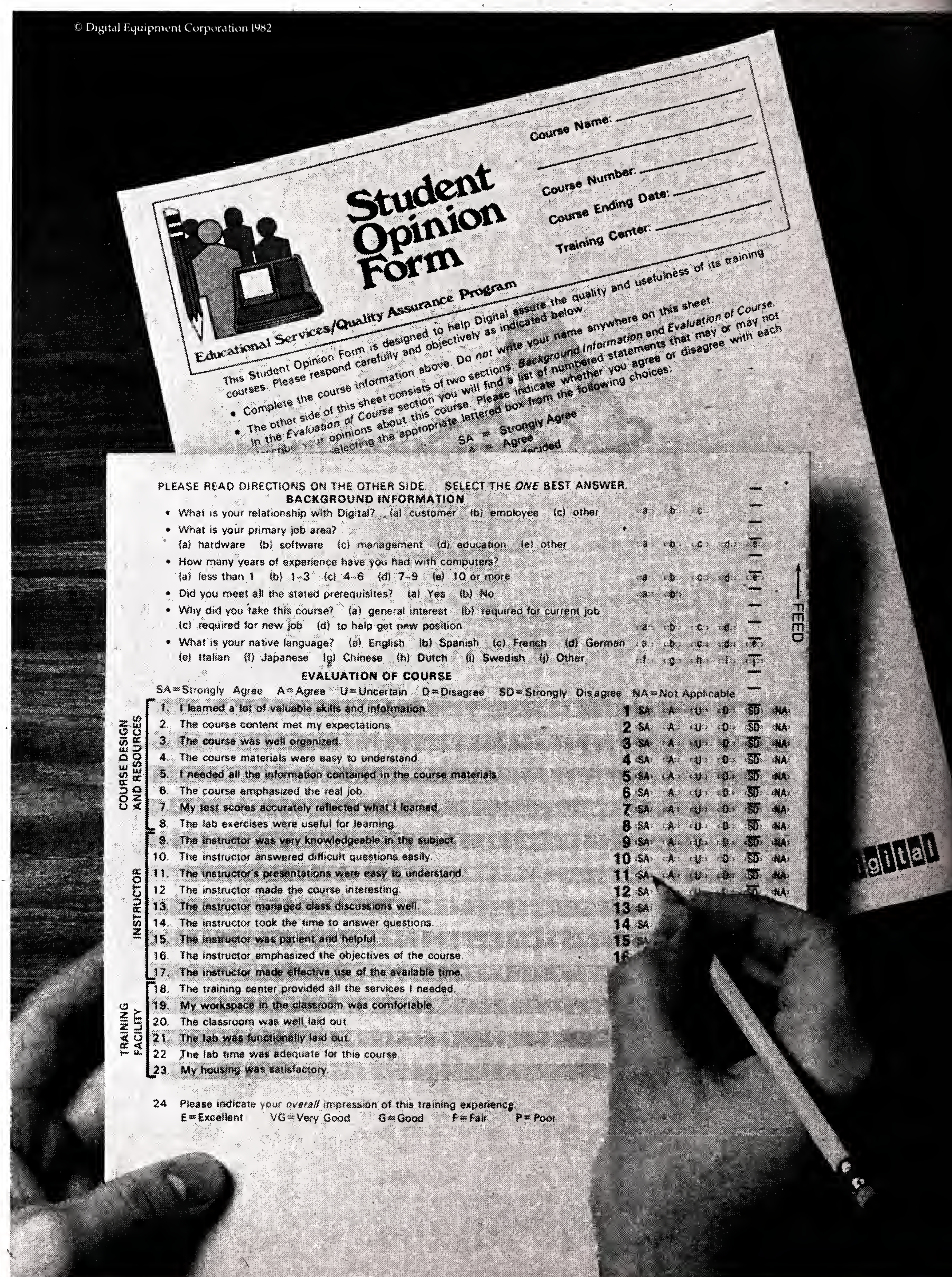
The conference fee costs $250. One-day fees are $80; the half-day fee is $40. Student admission is $25. More information is available from the Center for Professional Development and Public Service, Florida State University, Tallahassee, Fla. 32306.

Edition Offered On CAD/CAM

DALLAS — The third edition of "A Survey of Computer-Aided Design/Computer-Aided Manufacturing" (CAD/CAM) has been released by Leading Edge Publishing, Inc.

This text was compiled to help professionals purchase CAD/CAM systems. It features a tabular comparison of turnkey vendors as well as vendors of separate hardware and software products. It also reportedly contains strategies for cost/benefit trade-offs, a check list of management considerations and guides for development customized systems.

The reference tool costs $96 from the publisher at 317 Forest Central Two, 11551 Forest Central Drive, Dallas, Texas 75243.



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Student Opinion Form

Educational Services/Quality Assurance Program

Course Name: ______

Course Number: ______

Course Ending Date: ______

Training Center: ______

This Student Opinion Form is designed to help Digital assure the quality and usefulness of its training courses. Please respond carefully and objectively as indicated below.

- Complete the course information above. Do *not* write your name anywhere on this sheet.
- The other side of this sheet consists of two sections: *Background Information* and *Evaluation of Course*. In the *Evaluation of Course* section you will find a list of numbered statements that may or may not [illegible] your opinions about this course. Please indicate whether you agree or disagree with each [illegible] selecting the appropriate lettered box from the following choices:

SA = Strongly Agree
A = Agree
[illegible]ecided

PLEASE READ DIRECTIONS ON THE OTHER SIDE. SELECT THE *ONE* BEST ANSWER.

BACKGROUND INFORMATION

- What is your relationship with Digital? (a) customer (b) employee (c) other a b c
- What is your primary job area?
  (a) hardware (b) software (c) management (d) education (e) other a b c d e
- How many years of experience have you had with computers?
  (a) less than 1 (b) 1-3 (c) 4-6 (d) 7-9 (e) 10 or more a b c d e
- Did you meet all the stated prerequisites? (a) Yes (b) No a b
- Why did you take this course? (a) general interest (b) required for current job
  (c) required for new job (d) to help get new position a b c d
- What is your native language? (a) English (b) Spanish (c) French (d) German a b c d e
  (e) Italian (f) Japanese (g) Chinese (h) Dutch (i) Swedish (j) Other f g h i j

FEED

EVALUATION OF COURSE

SA = Strongly Agree A = Agree U = Uncertain D = Disagree SD = Strongly Disagree NA = Not Applicable

COURSE DESIGN AND RESOURCES
1. I learned a lot of valuable skills and information. 1 SA A U D SD NA
2. The course content met my expectations. 2 SA A U D SD NA
3. The course was well organized. 3 SA A U D SD NA
4. The course materials were easy to understand. 4 SA A U D SD NA
5. I needed all the information contained in the course materials. 5 SA A U D SD NA
6. The course emphasized the real job. 6 SA A U D SD NA
7. My test scores accurately reflected what I learned. 7 SA A U D SD NA
8. The lab exercises were useful for learning. 8 SA A U D SD NA

INSTRUCTOR
9. The instructor was very knowledgeable in the subject. 9 SA A U D SD NA
10. The instructor answered difficult questions easily. 10 SA A U D SD NA
11. The instructor's presentations were easy to understand. 11 SA A U D SD NA
12 The instructor made the course interesting. 12 SA SD NA
13. The instructor managed class discussions well. 13 SA
14. The instructor took the time to answer questions. 14 SA
15. The instructor was patient and helpful. 15 SA
16. The instructor emphasized the objectives of the course. 16
17. The instructor made effective use of the available time.

TRAINING FACILITY
18. The training center provided all the services I needed.
19. My workspace in the classroom was comfortable.
20. The classroom was well laid out.
21. The lab was functionally laid out.
22 The lab time was adequate for this course.
23. My housing was satisfactory.

24 Please indicate your *overall* impression of this training experience.
E = Excellent VG = Very Good G = Good F = Fair P = Poor

Concentrate on Preventing Contract Litigation: Lawyers

By Paul Gillin
CW Staff

John Conley

CW Photos by P. Gillin

James Marcellino

WALTHAM, Mass. — Buyers of computer equipment and software expend too many resources fighting breach of contract and fraud suits and too few resources defining contract language and remedies that could prevent litigation, according to two attorneys who specialize in computer contract law.

Because so many areas of computer contract law are ill-defined, buyers should try to negotiate a contract that defines the responsibilities of each party and spells out what happens if the relationship founders, agreed John M. Conley and James J. Marcellino, attorneys at the Boston-based law firm of Gaston Snow & Ely Bartlett. The two lawyers spoke at a recent meeting of the New England Computer Law Forum here.

"Generally, a computer contract states that the equipment will be free from defects in workmanship and materials for one year and that the release will meet the specifications of the product," Marcellino said.

He added, "I'm also not quite sure what 'free from defects' means when applied to software."

Under the standard contract limitations, the vendor is required only to repair or replace a product under warranty, Marcellino said, even though the remedy might be wholly inadequate for the user. "What makes anyone think the vendor can provide a cure when they couldn't even do it right the first time?"

Marcellino outlined five practical points for a buyer to follow to avoid contractual calamity:

- Understand the contract language and be sure it specifies the maintenance responsibilities of the parties and remedies. The language should be written in terms that can be understood by a jury and the buyer should be relatively certain the pact can stand up in court.

  "It is my view that you can set out in the contract the period of time you have to test the system" and reject it without risk, he said.

- Understand computer sophistication vs. bargaining power. A jury is more likely to let a small business get away with pleading ignorance than a big company, Marcellino said. "Even if you're a big company without much computer sophistication, don't expect ignorance to get you out," Conley added. "A jury will believe you have the money to hire experts."

- Decide how to effect cover. If you are looking to switch software packages, Marcellino said, "should you tell your current vendor you're going to check out other vendors and risk losing his maintenance and support or do you just go looking without telling him at all? In litigation, the vendor will argue you're using trivial problems [as an excuse] to switch packages. My recommendation is to tell your current vendor about your problems and at the same time look elsewhere."

  Anything written on paper is subject to discovery (compulsory disclosure) in court, he said. If you are going to go looking for a new product and not tell your vendor, do not write that fact down.

- Use a fact-based record-keeping system. If a technician fails to fix a problem, record the fact that the system still does not work and not your opinion that the technician tried hard to fix it. "Record facts, not opinions," Marcellino said. "Facts win cases. It simplifies the task [of arguing the case] and I believe it will generally help you avoid litigation."

- Understand the attorney-client privilege. It provides protection for what is said between an attorney and a client. If something goes wrong, consult an attorney first, Marcellino said. Conversations with anyone else may be discoverable in court.

Current users can also take steps to insure themselves, he added. "We recommend you should have a [technical] expert in on the deal before the contract is signed," he said. "If not, get the expert in as soon as possible."

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digital

Bibliography of Computer Books Released

By J. Daniel Couger
Special to CW‡

The Thoth System is an example of a high-quality book included in the 16th edition of the *Annual Bibliography of Computer-Oriented Books*, released this month by the University of Colorado. Thoth is a technique for multiprocess structuring and portability developed by the University of Waterloo.

Only 20% of the 276 new books included in the bibliography can be classified as of high quality; nevertheless, at least one good book was published in over half of the bibliography's 61 categories. The most significant improvement occurred in the categories of advanced programming and microcomputing.

On the other hand, several dozen inadequate books were published in the micro area, and those books are excluded from the bibliography. Among those retained are *IBM's Personal Computer* by DeVonney and Summe and *Structure and Programming of Microcomputers* by Jermann.

Of the 12 new books on management of DP, five are quite good, including Singer's *DP Manager's Survival Manual* and Nolan's *Managing the Data Resource Function.*

All introductory-type books published prior to 1980 were deleted from the bibliography. Despite the deletions, the bibliography still contains more than 1,000 books from 170 publishers. The bibliography separates the books into 61 categories and catalogs them according to type (reference, textbook, handbook) and style of presentation (programmed instruction, case study or narrative).

Maintenance Programming

With over 50% of the typical DP labor budget spent on maintenance, it is surprising that so few books have been written on the subject. A new section on maintenance in the latest edition of the bibliography contains seven books, compared with more than 10 books on programming new applications.

The oldest maintenance book has been out for only two years, Parikh's *Techniques of Program and System Maintenance.* The second edition of that book was released this year and was considerably strengthened.

An important new entry on this topic is *Maintenance of Computer Programming* by Martin and McClure.

Advanced Programming

The section on advanced programming now contains 115 entries. Among the better books are *Formal Methods of Program Verification* by Berg and three coauthors and Gerald Weinberg's *Walkthroughs, Inspections and Technical Reviews. Portable Programming* (Wallis) is another solid addition to that section.

Pascal finally supplanted Basic for the honor of the largest number of new books on a specific language. Sixteen new Pascal books were published, compared with 15 on Basic.

Despite the number of Fortran programs still in existence, new books on the language are scarce. Only five new Fortran books were published.

In contrast, four new Ada books were published. The section on the new language, Forth, now has four entries. Surprisingly, three new books were published on the ancient RPG language. A combined total of 10 new books were published on Cobol and PL/I.

The section on special languages was expanded to 24 books. *A User Guide to the UNIX System* by Thomas and Yates is a valuable addition.

Microcomputer books dominate the additions to the section on books related to specific machines. Examples are *Apple Pascal* (Tucker) and *Fast Basic Beyond TRS-80 Basic* (Gratzer and Gratzer).

System Analysis and Design

Distributed systems took over first place in quantity of new books published on the subject of system analysis and design. Thirteen new books were added to the distributed systems section. Bray's *Distributed Database Management Systems* is one of the better newcomers.

Ten books were published last year on the subject of data base, increasing that section to 47 entries. *Logical Data Base Design* (Jones, Curtice) and *Strategic Data Planning Meth-*

(Continued on Page 22)

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Bibliography Covers DP Books

(Continued from Page 20)

odologies (Martin) are high-quality additions to that section.

Sprague and Carlson's *Building Effective Decision Support Systems* strengthened the decision support system/management information system category. Schneider's *Automated Tools for Information System Design* is an important addition to that category.

The communications section, containing a total of 27 books, was enhanced by Ahuja's *Design and Analysis of Computer Communications.*

Application Books

Because of space limitations, the only application books included in the bibliography concern business uses of the computer. Of the 31 new books in that category, the Visicalc books were predominant. A representative one is Anbarlian's *Introduction to Visicalc Matrixing for Apple and IBM.*

Examples of improvements in accounting are Cushing's *Accounting Information Systems* and *Auditing Computer Applications* by Davis and Perry. *Directions in Human Computer Interaction* (Badre, Shneiderman) improves the behavioral application section. Grawoig and Hubbard's *Strategic Financial Planning With Simulation* is an important new application book, as is *Professional Forecaster* by Cleary and Levenbach.

The best of the new production application books is *Principles of Inventory and Materials Management* by Tersine.

The fastest growing application area, for the second consecutive year, is office automation. That section now contains 27 books.

Artificial Intelligence

The section on cybernetics and artificial intelligence now contains 26 books. The 978-page, two-volume publication by Winston and Brown, *Artificial Intelligence*, is impressive not only in size but in content. At the other end of the size continuum, but also valuable, is Klopf's *The Hedonistic Neuron.*

In addition to the previously mentioned books on management of DP, Weil's *Information Systems in the 80's* should be in the library of every person involved in DP planning. *Guidelines for Evaluation and Selection of Software Packages* (Brownstein and Lerner) is another valuable reference for managers.

Unfilled Needs

The lack of new books in several important areas may be indicative of the lack of progress of computing in those areas. The section on computers and society had no 1982 additions. Nor did the sections on marketing and government applications. One hopes that some creative work is nearing completion in those areas.

The 16th edition of the *Annual Bibliography of Computer-Oriented Books* is available for $4 from Computer Newsletter, Box 7345, Colorado Springs, Colo. 80933. The cost is $6 if an invoice is required.

Couger is a professor of computer and management science at the University of Colorado.

Free Brochures

- "CICS Security Package Evaluation Checklist" was designed to aid software users in the task of evaluating and selecting appropriate software to fill their security needs. The brochure includes detailed questions to help readers critique any CICS security system. It can be obtained from Bernie Burke at On-Line Software International, Fort Lee Executive Park, 2 Executive Drive, Fort Lee, N.J. 07024.
- "Small Computers — A Maintenance Challenge and Opportunity for the Eighties" is a four-page booklet that outlines the maintenance challenge confronting computer companies and presents new self-maintenance concepts for computer manufacturers and users alike. It is available from Innovative Computer Products, 18360 Oxnard St., Tarzana, Calif. 91356.
- Monolithic Memories is offering five new application notes and design instructions. These include "Proms, Pals, Fifo and Multipliers Team Up to Implement Single-Board High-Performance Audio Spectrum Analyzer"; "A Dedicated Multiplier/Divider Speeds Up Multiplication and Division for 8-Bit Microprocessors"; "Fifo: Rubber Band Memories to Hold Your System Together"; "Big, Fast and Simple — Algorithms, Architecture and Components for High-End Superminis"; and "Using ADPCCM for Image Compression." The frim is at 1165 E. Arques Ave., Sunnyvale, Calif. 94086.

IEEE Offers Scholarships

SILVER SPRING, Md. — Four newly established $3000 scholarships are available for the 1983-1984 academic year from the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE).

The Richard E. Merwin Scholarships, named after the late IEEE Computer Society president, are available to Computer Society student members who are active in the student branches of this society. Students must have maintained a grade point average of at least 2.5 and be full-time students in a computer-related discipline.

For more information contact IEEE at P.O. Box 639, Silver Spring, Md. 20901.

Introducing the portable computer for professionals on the move. Hewlett-Packard's new HP-75.

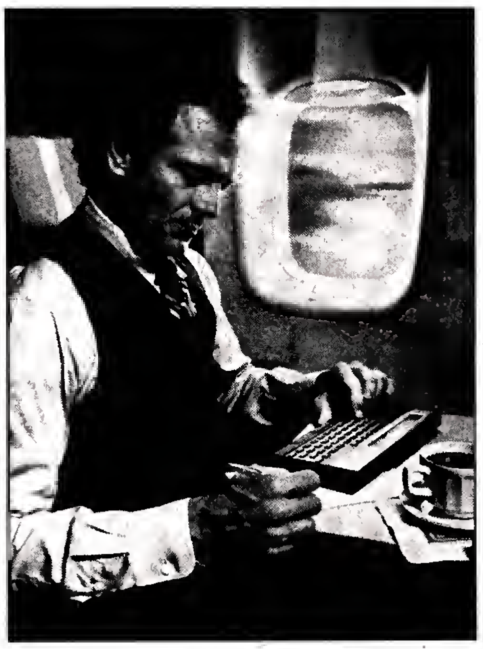
A decade ago, we introduced the world's first scientific pocket calculator and rendered the time-honored slide rule obsolete.

Now we're introducing the HP-75 portable computer. And if press reaction is any indication, history is about to repeat itself.

As small as a book. As powerful as a personal.

Desktop-computer power in a handsome 26-ounce package. That's the HP-75. It's just 10 inches by 5 inches by 1¼ inches.

But don't let the compactness fool you. Inside its rugged case lies a 48K-byte, ROM-based operating system. With a comprehensive, 147-command instruction set that helps you write hard-working, memory-efficient BASIC programs.



Plug-in ROM ports let you add up to three 32K-byte software modules—modules that solve tough problems *without* sacrificing user memory.

And that user memory gives you up to 24K bytes of program and data storage.

It all adds up. A fully loaded HP-75 is a 168K-byte computing powerhouse in calculator clothing.

Want more? A built-in magnetic card reader provides a convenient, inexpensive way to store and retrieve programs or data.

The HP-75's typewriter-like keyboard means rapid, accurate entry of text or data. And when we say you can touch type on it, we *mean* you can touch type on it.

Those keys, by the way, can be redefined with your favorite commands or programs. Up to 196 unique key combinations in all.

Immediate, convenient access to your most frequently used programs.

Thanks to the HP-75's multiple-file structure, programs, data and text can be named, simultaneously stored in memory, and programmed to interact with each other.

Add continuous memory, and you've got a computer that's designed to solve problems on the go. Simply load your favorite files and enjoy immediate access to any or all of them. The files are retained in memory until *you* decide to delete them—even when the machine is turned off.

Time and appointments to keep you on schedule.

The TIME key brings to display the day of the week, date and time to the nearest second.

The APPOINTMENT feature reminds you—an hour from now or a year from now—of things you have to do. You can have a silent message on the display, any one of six alarms, or a combination of both.

Even if the machine is turned off, it will "wake up" and alert you of an appointment. Or it will execute programs or control peripherals according to predetermined schedules.

In an environmental test, for instance, where readings are taken every half hour, the HP-75 can make sure its owner gets the weekend off.

Software tailored to solve your specific problems.

HP-75 software is now available in areas such as math, engineering, finance, and statistics. With spreadsheet analysis* on the way.

Our plug-in math module* for instance, solves polynomial roots, evaluates integrals, and performs finite Fourier transforms.

With our text-formatter module** you'll compose memos, letters, and short documents virtually anywhere; then print them out when you return to your home or office.

In addition, our third-party software program assures you of ever-expanding software variety.

If you're a volume purchaser or OEM, give us a call. We can help you create custom HP-75 systems with special plug-in modules, magnetic cards, digital cassettes, and keyboard overlays.

Peripherals for a total computing package.

The HP-75 is equipped with the Hewlett-Packard Interface Loop, giving you a choice of 15 peripherals. (And that choice is expanding. The HP-75 *can* work simultaneously with up to 30.)

In a battery-powered briefcase system weighing about seven pounds, you might have the 24-character printer, digital cassette drive and acoustic modem.***

A desktop system might include the 80-column impact printer, full-color graphics plotter, and 12-inch video monitor.

And the HP-75 can "talk to" other computers, peripherals, and instruments with our HP-IB (IEEE-488),** RS-232,* and GPIO interfaces.

In summary, the HP-75 is the heart of an extremely versatile system, in addition to its stand-alone capabilities.

Manuals to make sure you get the most from your machine.

Chock-full of examples and helpful hints, our owner's manual will get you up and running in short order. And it's organized to help you access the information you need to get on with the job at hand.

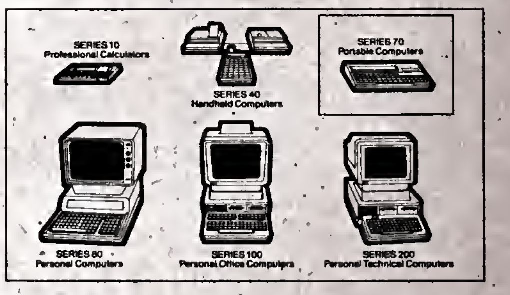
A supplementary reference guide provides a concise summary of the computer's operating protocol and instruction set.

The value you're looking for.

What is the price of all this power in this compact package? $995.**** A lot less than you might pay for a personal computer you can't take with you.

See the HP-75 today. It's the smart choice for professionals on the move.

For the authorized HP dealer or HP sales office nearest you, call TOLL-FREE 800-547-3400 (Oregon, Alaska, Hawaii: 503-758-1010). *TTY users with hearing or speech impairments, dial 503-758-5566.*



*Available May 1, 1983.
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Should Managers Hire Trainees?

Turnaround Time

By Larry E. Long

Q Your comments about entry-level programmers have been interesting to me for two reasons: I am the director of a data processing department and am responsible for proper staffing, and my son will attempt to find an entry-level position next year.

Your advice may not be representative of the "real" world. I'll admit that I am guilty of looking at staffing from a very narrow viewpoint, but my thinking is probably representative of that of other managers. The following represents some fragmented business reasons for not hiring trainees:

- **Entry-level people are not trained properly. The schools teach what it is convenient to teach and ignore the real requirements of industry.**
- **The cost to train an entry-level person is about $10,000, most of which is in the first year. If this $10,000 is added to the salary, it is easy to see that one can afford an experienced person.**
- **The typical entry-level person is a recent graduate who has been influenced by a teacher/instructor with little or no business background. He is taught to do something because "it is the correct" or "the only way to do it." However, in the business world it is necessary to take shortcuts.**
- **A patient senior person is required to guide an entry-level person. Without this resource commitment, an entry-level hiring program is destined for failure.**

When my son graduates, I will offer him the same advice I have given others. He should work for a company for six months at no pay and ask only for a letter of recommendation in return.

A Over the long term, your hiring philosophy may be deleterious to both your department and the corporation. When you hire people to fill project manpower requirements (for example, "bodies"), you hire someone for immediate, not long-term, purposes.

Since high-potential "experienced" people are rare and expensive, the choice is often between hiring someone with low potential and experience or a recent graduate with high potential. If you consistently choose the former, where will you be in five years with respect to productivity, systems quality and management potential?

You are correct in saying that entry-level people are not "trained" properly. Most academic institutions aspire to *educate* people by arming them with the ability to synthesize and learn. True, some institutions achieve this objective better than others, but some of them have more with which to work.

If it were the academic world's responsibility to teach job control language, then which vendor's language should be taught? *Training* is industry's responsibility.

You talk about the $10,000 cost of entry-level training and how that could be better applied to the salary of an experienced person. Don't forget that $10,000 increment must be applied annually.

I'm not recommending that all new employees come in at the entry level, but that the long-term potential and cost-effectiveness of entry-level hiring should not be overlooked.

I suppose this entire discussion is moot since there aren't enough experienced people to go around. To make matters worse, the business community is not making much of an effort to replenish this pool.

Q How can I get started in DP consulting? I have two years' programming experience, enjoy working with people and am eager to bring more interesting challenges into my life.

A A company engages a consultant because his unique experiences and expertise are needed to realize organizational objectives. Since people with your qualifications can be found in just about every shop in the country, there will not be much demand for your services.

One enters the DP consulting field after gaining experience and developing a marketable expertise. Also, advanced degrees have just about become a prerequisite for the successful information services consultant.

You may have said "consulting" and meant contract programming. If so, be advised that contract programming is not consulting — it is work force augmentation. These are often confused in print.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

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Numeric precision:
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Time/appointments:
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Memory:
• User (RAM)—16K bytes, expandable to 24K bytes • Operating system (ROM)—48K bytes
• Plug-in software (ROM)—up to 96K bytes (3 32K-byte modules)

Typewriter-like QWERTY keyboard:
• 65 keys • 194 redefinable key combinations
• "Hidden" numeric keypad

Integral mass storage: hand-pulled card reader (1.3K bytes per card)

Built-in interface: HP-IL; choice of 15 peripherals

Power supply: 3 AA NiCad batteries (AC adapter/charger included)

Liquid-crystal display: 32-character window on 96-character line

PG02304 282 C

Confection Firm Finds Sweet Deal in Simulator

CAMBRIDGE, Mass. — Installing a program simulator turned out to be a sweet deal for the data processing department at Nabisco Confections, a subsidiary of Nabisco Brands, Inc.

Nabisco Confections, which makes a variety of popular candies including Junior Mints, Sugar Daddies, Sugar Mommas, Sugar Babies and Pom-Poms, had first computerized in 1969. The DP department has since grown to include 22 terminals connected to an IBM 4331 running DOS/VSE. However, the department had never found time to document the programs developed over the years. As a consequence, a backlog of more than 400 undocumented applications had developed.

"When you've got a small staff you develop a program and then management comes along and gives you another project," said Don Dunn, director of data processing at Nabisco Confections. "You simply don't have time to keep your documentation up to date."

Dunn found the problem became more pronounced as the DP department at Nabisco Confections grew in size and responsibility. The company was running major programs like payroll, accounts payable, sales and marketing analysis, order entry, inventory and more, all developed in house and none fully documented.

"My two application programmers are crackerjack systems people," he said. "But given our mass of existing programs how do you motivate people to perform maintenance on undocumented programs?"

Dunn took advantage of a windfall he found at the end of last year. "Near the end of last year I found I had a few extra bucks in my budget," Dunn said. While reading a trade magazine he came across an article about Structured Code Analysis (Scan)/370 from Group Operations, Inc. "With a huge inventory of undocumented production programs undergoing constant maintenance, two application programmers new to the organization and constant demand for new application development, I responded to Scan/370," Dunn said.

After checking with some user installations, Dunn contracted with Group Operations to become the first DOS installation for Scan/370. "We had a few glitches at first, but the vendor's support staff nailed those down over the phone," Dunn said.

Documenting Time Reduced

Having originally budgeted six to eight months to document Nabisco Confections' backlog of programs, the programming staff was pleased to find the project completed in three months.

"If I had to go back and document every program, including some that were four to five years old, it would have taken a helluva long time," Dunn said. "Scan/370 has saved us six man-months."

Scan provides the user with a list detailing exits and subroutine jumps. Dunn said the product works especially well with the nonstructured "spaghetti code" Nabisco Confections has always used for program development.

Particularly useful to Dunn's staff is a "before and after" snapshot feature that allows the programmers to see exactly where changes were made. "Any time we change a program we recompile and then run through Scan," Dunn said. "That feature is especially good for auditing."

Dunn admits that Scan/370 is still "half a loaf," because it offers only program documentation. "It doesn't give system flowcharts, runbooks for operations or narratives," he said. "It couldn't document systems work."

But he said the package was well worth the $15,000 price tag. "For a small installation such as ours money is obviously a factor, but more important was the need to accomplish many things without installing three or four packages to do what Scan/370 alone can do," he said.

NBS Offers Publications

WASHINGTON, D.C. — The National Bureau of Standards has announced the availability of three data-processing-related publications.

"The Selection of Local Area Computer Networks" (SP 500-96) gives advice on features of different networks, how to identify the needs of an installation and how to determine which network will support those needs. It costs $6.

"Planning for Software Validation, Verification and Testing" (SP 500-98) is aimed at helping programmers and managers select and use validation, verification and testing tools. Priced at $5.50, it describes a phased approach to software development and describes the fundamental concepts of verfication, validation and testing.

A companion to that report is "Software Validation, Verification and Testing Technique and Tool Reference Guide," which describes 30 techniques and tools for verification, validation and testing. This publication is priced at $6.

The publications can be ordered from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20234.

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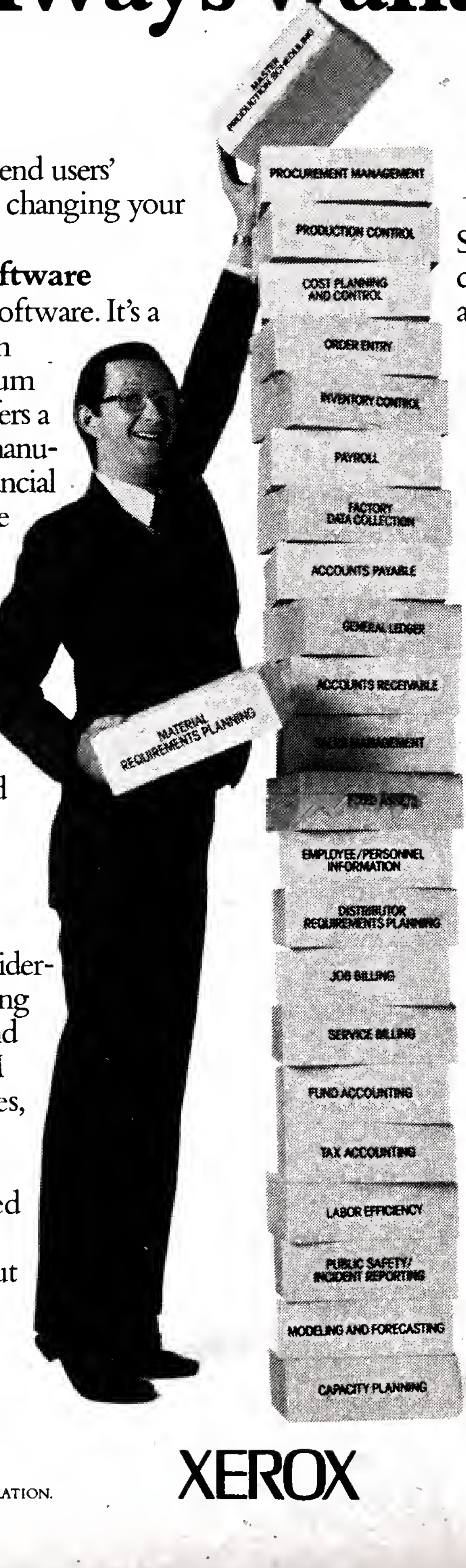

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We'll get you up and running with a comprehensive training and implementation program. After that, we'll always be on hand to help in any way we can.

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Function keys	14	No	10	14	3	22	22	22
Line graphics	No	No	No	No	No	Yes	No	Yes
Page/line transmit	Yes	No	No	Yes	No	Yes	Yes	Yes
Character/line editing	Partial	No	No	Yes	No	Yes	Yes	Yes
Split screen	No	No	No	No	Yes	Yes	Yes	Yes
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Price (in quantity of one)	**$595**	$595	$699	**$645**	$645	**$895**	$995	$1,195

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Firm Meets 'Focus' Needs With Minicomputer

NEW YORK — Time-sharing just was not enough for a software vendor here when it came to handling customer training and program development.

Information Builders, Inc. had been tied into a time-sharing network, but found it was not adequate to demonstrate all the features of its Focus information control system product. In particular, high-speed terminal support, which was essential for using the full-screen formatting and graphics capabilities, was not available.

According to company President Gerald Cohen, Information Builders considered several systems in its search for a suitable computer, including IBM's 4331 Group 1, but found its memory capacity of 1M byte unable to support Focus effectively. Magnuson Computer Systems, Inc.'s M32 was also considered, but its processing power and price tag were both more than Information Builders required.

The company then learned of Formation, Inc.'s 32-bit minicomputer, the F/4000. This product was found to be compatible with the IBM 370 system and could support all of the IBM operating systems and any application software designed for the IBM environment. But unlike the 370, the F/4000's 8M-byte memory capacity could easily accommodate the core requirement of the Focus package under VM/CMS, according to Cohen.

In April 1981, representatives from Information Builders visited Formation headquarters with a tape containing Focus code.

"In a matter of minutes, Focus was up and running on the F/4000 under VM/CMS," Cohen said. As a result, the F/4000 was selected.

Alan Gerber, computer facilities manager at Information Builders, said that since its implementation in July 1981, the F/4000 has satisfied everyone's expectations.

In addition to using the system for all customer training and marketing demonstrations, other applications, including administrative functions and program development, have been added.

Having an in-house machine has afforded much more control and accessibility in the company's system development efforts, according to Cohen.

He said that good throughput is the most important consideration with a system like Focus and noted that the F/4000 offers "a very cost-effective way of providing services."

Information Builders reportedly is running the latest release of IBM's VM/SP on their new system. Also, IBM's Remote Spooling Communications Subsystem and IBM's VM Pass-Thru are used to make IBM's TSO available from the service bureau via an F/4000 terminal.

The system is now utilizing 3M bytes of memory, eight Formation F4277 terminals and three IBM 3277 display stations on an IBM 3272 cluster.

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Study Outlines Tax Recovery

PRAIRIE VILLAGE, Kan. — "Let The Government Pay for Your Computer" is the name of a recently published report from Research Press, Inc.

According to this report, there are a number of ways that buyers of desktop and personal computers can justify a substantial tax recovery for their purchases via depreciation and business expense tax write-offs.

The booklet is available for $6 from Research Press, Inc., Box 8137-P, Prairie Village, Kan. 66208.

DPMA Group Elects President

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA) Education Foundation has elected Terrence J. Boyer as its president for 1983. Elected a foundation regent in early 1981, Boyer is vice-president and manager of information planning and control for Mercantile Trust Co., N.A., St. Louis, Mo.

Boyer is currently coauthoring the first textbook in the DPMA's Model Curriculum series, titled *Computer Information Systems: An Introduction,* scheduled to be released soon.

Boyer is the former president of the St. Louis chapter of the DPMA and has achieved the DPMA Gold Award. For the past two years, he has been the coordinating regent responsible for the foundation's Model Curriculum for Undergraduate Computer Information Systems Education.

Boyer has over 20 years of experience in information processing, of which the past 12 years have been with Mercantile Trust. Previously, he was manager of applications systems at Mercantile. He holds a B.A. from Ohio State University and a master's degree from Southern Illinois University.

The DPMA's Education Foundation was established in 1975 to expand educational opportunities for information systems professionals and to conduct research and programs of benefit to the DP industry, educators, business, government and the public.

Indiana Squeezes Manager Out of Entry/Edit System

INDIANAPOLIS — Indiana's Marion County Welfare Department has managed to squeeze application management functions out of a data entry/editing system designed for grass roots administrative tasks.

Marion County is using its Inforex, Inc. System 3200 data entry/editing system to streamline the distribution of food stamp coupons, provide closely controlled participant coordination with the state welfare agency and to monitor and control its own expenses and disbursements.

Administrative analyst Ben Tuttle, who has one course in Cobol programming under his belt but no programming experience, "began playing around with the system immediately when I started this position a year ago," he explained.

"The state's Food Stamp and Aid to Dependent Children Programs wanted to cut problems they were having with the Authorization to Participate [ATP] cards," he said, "but I didn't like a lot of their concepts because they would have been impossible to administrate in terms of our case load."

The ATP card is mailed out to food stamp recipients to be used like a check, Tuttle explained. The family then brings the card to a food stamp point of issuance to get the stamps.

In "playing around" with the Inforex system, Tuttle "began to realize its capabilities and developed the concepts I liked" in food stamp administration.

The result was more than a dozen programs written in Inforex's Ideal data entry programming language. "Over the course of about two months, I squeezed the programming in where I could," Tuttle said. "I utilized primarily the machine's capability to reformat files and used the efficiencies of data input."

Valuable Link

Twelve of Tuttle's programs help provide a valuable link with the state welfare department's computer in maintaining accurate records of food stamp program participants.

Marion County updates daily the computer tapes sent from the state agency, adding new families and deleting others that are no longer eligible — approximately 2,000 to 5,000 per day — and prepares updated rosters of eligible households for use at the food stamp point of issuance. One of the 12 programs used for this application is a three-page document providing a list of job statements to be entered by the input operator.

The work the Marion County Welfare Department does in the food stamp program has already produced savings in prevented duplicated payments. A plan is currently being developed to eliminate mailing food stamp eligibility notices to households and simply use the daily control rosters at the points of issuance.

"We've used listings in the past, but this plan would include daily updates of the rosters for a more workable listing size," Tuttle said. When fully implemented, the savings in postage could amount to $5,000 per month.

Other programs aid the accounting department in producing reports on collections and disbursements made by the county, including detailed analysis by account incorporating year-to-date totals and remaining account balances. Information provided by the accounting department is entered centrally, sorted and reformatted and printed by the System 3200.

Marion County first started using Inforex data entry systems in 1972 for basic accounting support applications. In 1981, the department upgraded that system to the System 3200 with four keystations, 10M bytes of disk storage and a tape drive.

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EDITORIAL

Don't Pack Your Bags Yet

The decision by the American Federation of Information Processing Societies, Inc. (Afips) to hold next year's National Computer Conference at some site other than Houston is basically a sound one. It will obviously benefit the vendors, and it will have an impact on the tens of thousands of users who travel from all over the world to attend the mammoth show each year. However, the decision does have its potential thorns.

Without a doubt, NCC and its crowds have outgrown nearly every convention center in the U.S. In New York, although the convention was based at the Coliseum, which is adjacent to the city's famed Central Park, the exhibits and lectures were split between surrounding hotels. Users attending a New York-based show not only had to cope with the flood of information and vendor pitches common to the NCC, but they had to be marathoners to sit in on presentations held in various parts of the city.

Anaheim, Calif., the site of this year's show, is little better. Although the city has a larger exhibit hall — the Anaheim Convention Center — the NCC exhibits usually overflow into the garages that hang like wings from the sprawling building. As veterans of the "Disneyland circuit" know, the metal and concrete structures become high-tech ovens when filled with the crowds and baked under the hot California sun. State-of-the-art machines, unlucky enough to be relegated to the garage, often succumb to the combination of heat and hordes.

And in both cities, if hotel reservations were not made at least a year in advance, show attendees had either to double up with willing friends or to stay at less-than-four-star hotels that might be up to a one-hour drive away.

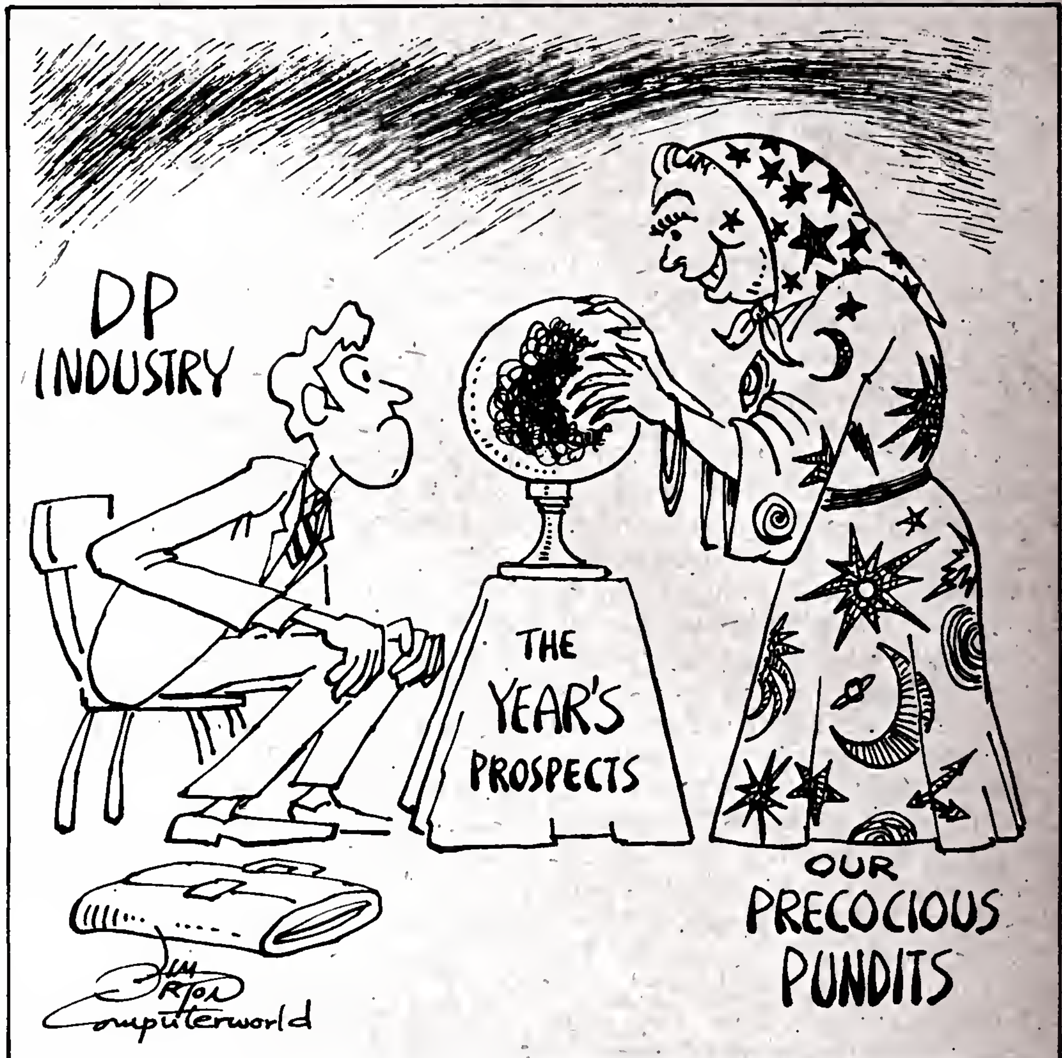
Afips reported that the 1984 convention site will be either Las Vegas or Chicago, both of which reportedly have adequate display facilities and hotels to handle the more than 100,000 people who are expected to attend the show. But don't pack your bags yet.

Although the NCC Committee has ruled out Houston as a site, that city claims it planned to renovate its Astrodomain complex to the tune of $50 million and has an additional 4,000 hotel rooms since last summer. The loss of $47 million in business brought by the show and the impact of that loss on the city's Texas pride hint that Houston has not yet given up the fight for NCC.

In addition, Afips plans to hold the 1984 computer show in midsummer, probably early July, forcing executives, managers and users alike to cancel or rework vacation schedules and to juggle budgets and acquisitions that might be based on spring equipment and technology debuts.

Last year, vendors and users complained to Afips that details and schedules of the 1982 show were withheld until the last possible moment.

This year, Afips has revealed its plans for the 1984 event well in advance. Unfortunately, those plans have all of the elements of a fair, albeit lopsided, television soap opera: three possible locations, a disgruntled city and 100,000 people left waiting at the technology altar.



'I See You Next New Year's Eve, Drinking a Champagne Toast to Your 1983 Accomplishments — Or Is It Cyanide?'

LETTERS

The 'Real' Message

The final paragraph of the editorial, "Think Twice" [CW, Jan. 17], which is about the IBM vs. Bridge Technology, Inc. trade secrets case, is a non sequitur.

For *Computerworld* to say that "the real message . . . is that IBM is ready to make examples of those close to the company with higher ambitions" ignores the fact that IBM proprietary assets were misappropriated and misused.

The permanent injunction obtained by IBM has nothing to do with anyone's "higher ambitions." Rather, it is designed to prevent illegal acts.

The *real* message, to use your term, is that people should not act unethically or illegally.

Furthermore, to say that "companies will have to think twice before deciding to tackle a market in which IBM already has a presence" again ignores facts.

Many honorable and able competitors continue to offer products in areas where IBM has a presence, and they do so without misappropriating trade secrets.

Edward Nanas
Director of Information
IBM
Armonk, N.Y.

From the 'Outside In'

Edmond H. Weiss makes some valuable points in the In-Depth article "Usability: Toward a Science of User Documentation" [CW, Jan. 10], in particular, his suggestion that a detailed technical review take place early on in the documentation process.

He is incorrect, however, in his description of users as creatures that are as "passive and dependent as electronic circuitry." In addition to this, I do not agree that it is the purpose of documentation to "control" users.

The fundamental problem with Weiss' documentation process is that it works from the "inside out," that is to say, from the technical to the general.

In my experience, the best user documentation is written from the "outside in" — that is, by a writer with a limited technical knowledge of the system who can adopt the user's perspective and begin with the question, "How will the system help me to do my job?"

It should be the purpose of user documentation to aid the user in controlling the system.

Technology must serve people, not the other way around.

Naomi Leventhal
Performance Resources, Inc.
Falls Church, Va.

On Hiring a Lawyer

The article "Lawyers: Seek Legal Aid During Contract Talks" [CW, Jan. 10] quotes an attorney who recommends that lawyers be involved in purchases of software over $10,000 or purchases of hardware over $30,000.

The value of the transaction to the buyer's business and the potential damages he may suffer if something goes wrong should determine whether a lawyer is used.

At the dollar levels cited in the article, most of us would be forced to hire a lawyer every time we bought a new car.

Peter A. Marx
Vice-President and
General Counsel
Chase Econometrics
Interactive Data Corp.
Waltham, Mass.

SOFTLINE / Werner L. Frank‡

A Look at Computing in Southeast Asia

The fourth biannual Southeast Asia Regional Computer Conference (Searcc) met recently in Kuala Lumpur, Malaysia. In attendance were nearly 600 delegates, representing the data processing communities of seven member country associations, including the hosting Malaysian Computer Society and similar groups from Indonesia, Singapore, Hong Kong, the Philippines, Thailand and India. The language common to these representatives is English.

I was privileged to be an invited guest speaker, along with a number of others representing the U.S., Japan and the local areas. The visit provided an in-depth look at computer-related activities in this developing area of the world.

What a difference 13 years makes! I recall leading a U.S. Commerce Department trade mission for DP in 1970 to this very same area. At that time, data processing was the province of only the largest multinational companies, with small installations at the leading bank, universities and, perhaps, the central government. Now computers are distributed much more widely, and all sizes are utilized, from the smallest micro to sophisticated mainframes embedded in telecommunications networks.

A thriving and rapidly growing example of commitment to the promise of the computer is Malaysia itself. Founded in 1957 as an independent country, this nation is moving rapidly to achieve a modern and viable economy. Here both industry and government recognize the role that DP plays in providing productivity improvements in basic production, public administration and manpower performance.

Malaysia counts approximately 550 computers in the categories of minis and mainframes. This census includes large-scale computers from IBM, ICL, Inc. and Sperry Univac, with other vendors, especially the Japanese, actively marketing the area. Planning for the future is based on the widely accepted expectation that current installations will be upgraded to even larger systems.

The national government of Malaysia has shown aggressive leadership in recognizing the potential benefits of automation. Led by the Modernization and Manpower Planning Unit (Mampu) in the prime minister's office, the federal government provides leadership and guidance to all elements of administration. Encouragement and direct consulting aid assists other governmental units wishing to embrace DP. Policy and direction are also provided.

Two Significant Steps

Governmental awareness of the importance of the computer is evidenced by two significant steps that were taken during my one-week stay in Kuala Lumpur. First, the Ministry of Education announced plans to introduce the subject of computer science into the secondary schools. An official declared that "there is no way we can leave out computer science from our school curriculum. This field has come to stay in every aspect of government machinery and the business of the private sector. Our students must, therefore, be given a grounding at an early age."

This enlightened thinking was further endorsed when the government took the bold step of completely eliminating the previously existing 25% custom duty on all imported computer hardware. This step was announced on the final day of the Searcc '82 conference and received rousing applause during the closing ceremonies.

Even without the excise tax, a computer is a more expensive item in this part of the world than in western countries.

Consider, for example, the published price of an Osborne Computer Corp. computer at 7,000 ringgit (Malaysian dollars), which may be converted to about $3,000 — almost twice the cost of the same device sold in the U.S. Recognizing the lower wage structure in Malaysia, at about 50% of the U.S. counterpart, one might conclude that Malaysians really cannot afford the personal computer. Nevertheless, the market is there, and it is growing rapidly.

Disparate Economic Situations

The disparity between the economic situations in Southeast Asia and the U.S. was poignantly emphasized during the conference when a U.S. delegate spoke of the benefits of office automation. A member of the audience questioned whether automation could be considered cost-effective in that part of the world where, in general, clerical labor and office space may be had for only 20% to 50% of the U.S. scale, while the hardware carries a 150% to 300% premium.

This economic disparity, although it seems to negate all arguments customarily advanced for computerized clerical routines, does not seem to diminish the interest of this region in computing or the commitment to aggressive pursuit of its benefits.

But there are limits, and the most stringent limitation is imposed by the dearth of well-trained and experienced personnel. There are, today, about 2,000 DP professionals in Malaysia; about 25% of them are affiliated with the Malaysian Computer Society. Hence, important topics at the conference were computer training and increasing users' productivity.

The minister of science, technology and environment, in his opening speech at the conference, addressed this problem and stated that Malaysia is short of 5,000 DP professionals to fill its near-term needs. This means that Malaysia needs to increase its number of trained DP personnel by a staggering 250%!

Important Issues

Programming productivity enhancement tools and higher order languages are, therefore, important issues that are now receiving attention. The marketplace for application software, data management and word processing systems is now in the limelight.

Malaysia is a particularly good market opportunity for word processing systems for two reasons. First, English is the important language used in commerce. Second, the native language, Malay, shares the same Latin alphabet, unlike the languages of surrounding nations, which are expressed in ideograms. Evidence of this national interest in computing was seen at the Computer Expo, the largest exhibit of hardware and software ever to have been shown in Malaysia. More than 50 companies, large and small, displayed their wares. The interest of the Malaysian general public was captured by this extraordinary computer caravan, and more than 7,000

(Continued on Page 30)

HUMAN CONNECTION / Jack Stone‡

He Might Not Agree, But He'll Take the Job

There are no moral conflicts with college students these days, at least not when it comes to their assessments of the computer industry. Though critical of merchandising practices, particularly in the mass market, several seniors we recently interviewed do not seem to be so unhappy with them as to reject job offers with computer manufacturers.

The conclusions of Tony Charles, a business major at a large state university, were typical:

"A friend of mine bought her young son a Timex/Sinclair 1000 for a Christmas present with the hope of encouraging him to become interested in computer machinery and, perhaps, someday taking steps toward a career in the field. But before wrapping it, she decided to have a look at the system to gauge the level of difficulty, having had some data processing experience.

"Well, she scanned the so-called 'self-teaching' manual for only a couple of minutes before she seriously considered returning the machine to the retailer.

This is the third article in a six-part series, "Computers and the Collegians," coauthored with Joanne Barker.

" 'If I can't get through the text, there's no way my son will,' she told me."

Setting It Up

"I borrowed the machine and, with my father's help, set it up. He's a long-term user and is familiar with Basic, but is certainly not a professional programmer. It turned out that the text was pretty easy to follow until we hit Chapter 2, which covered the setup of the tape cassette recorder for program storage. We tried for nearly an hour, but SAVE and LOAD would not work. I finally gave up for the day, but my dad continued for another couple of hours until he finally figured out a procedure to calibrate the recorder so it could be used, a subject that was unclear in the text.

"The next morning, we slugged our way through the rest of the text, dwelling only on the highlights. The machine was certainly powerful and what we tested worked just fine, except for just one little bug in an obscure program statement. The machine wasn't all that easy to learn Basic on but, in fairness, we attributed a lot of our problems to the poor manual. But my friend was right in her assessment. The text was more appropriate to an experienced professional and a $10,000 micro."

Hard-to-Understand Manual

"Of course, I don't know why they did, but Timex/Sinclair left an impression of unloading 'iron' in the marketplace. They've found a formula for mass-producing an inexpensive hardware item and did a good job of implementing it. But they seem to have cut the budget in regards to an easy-to-understand, easy-to-use manual and thereby made it very difficult for the average buyer to use the machine.

"The problem is that buyers expect the machine to do everything the higher priced micros do and to be just as easy to operate. And this is just not so.

"But I have concerns with other firms as well. For example, $30 for a video game cartridge is outrageous. What happens is that the teenagers get caught up in 'video game fever' and hit their parents up for more and more cartridges, often costing far more than the hardware. One very positive impact of the Timex/Sinclair is that its more realistic prices for cassette programs — about $10 — will tend to drag down the prices of competitive programs.

"Now, I am not suffering with current computer marketing practices. This is, thank heavens, a capitalistic society and firms are obviously free to sell what they want to sell, and buyers are free to buy or not to buy. And when I examine the Timex/Sinclair sales literature, I cannot really say the company overstated the machine in its advertising. If Timex offered me a big job in its Marketing Department, I'd go for it!"

LETTERS

'Back Up in the Stands'

As a long-time DP professional, I have been working hard to handle the personal computer/mainframe technology advance in a philosophical manner. However, I was disappointed with the article "Consultant Sees DP Mystique Disappearing" [CW, Dec. 6].

The article contrasted sharply with the excellent articles: "Do Spreadsheets Mean Micros?," which is from the same issue, and "Micro-CPU Link Eluding DPers [CW, Nov. 8].

The article puts forth what may be tolerated from 15-year-old microcomputer "experts," but responsible corporate management would not allow it from any professional.

In the article, Chuck Tesler of VM-CMS Consulting Services holds the basic premise that massive DP management incompetence exists. This is evidenced by his statements: "The mystique of computing . . . was an intentional fabrication on the part of DP professionals"; "[by going to management information systems (MIS), users get] treated abruptly [and are] subjected to delays"; "DPers will keep their heads in the sand and discard the growth of personal computers"; and he speaks of a growing user "awareness of DP shortcomings."

These statements are not substantiated in the mainstream. There are incompetents in every profession, but the record of success and contribution of the DP profession will stand up to more than this attack.

Tesler's comparison of responses — "On [an IBM] 3081, a four-second delay is considered normal in local mode; 15 seconds for remote locations. With a personal computer you hit a key and you have the information" — is, I think, irresponsible on both sides of the issue.

Whose standard is the four-second 15-second 3081 response? It is certainly not any generally accepted service-level standard. An instant response from a personal computer assumes the data base is available, some setup beforehand or programming has been done and the detail data for the analysis does not have to be laboriously keyed.

Tesler's economic analysis also indicates a lack of understanding of the basic business need to make a profit in order to stay in business.

His credibility as a consultant is seriously impaired by statements such as: "A company does not take any risk or need to justify heavy investments by turning to personal computers . . . if a microcomputer breaks down, [user department heads] simply go out and buy a backup for under $3,000"; "There are no longer any economic sanctions against the user computing in any way he wants to do it"; and "[a user dissatisfied with MIS will] simply go to the retail store and set up his own system."

I do agree with Tesler, however, when he says that DP managers in large corporations should, therefore, be attempting to position their companies to make the best combination of micros and mainframes. In fact, I accept this task.

I would also like to reemphasize the importance of a standard DP management task, namely, weeding out spectators from the true professionals.

I say, "Back up in the stands, Tesler."

John R. Morrison
Systems and Programming Manager
The Advanced Mortgage Corp.
Southfield, Mich.

Southeast Asia And Computing

(Continued from Page 29)

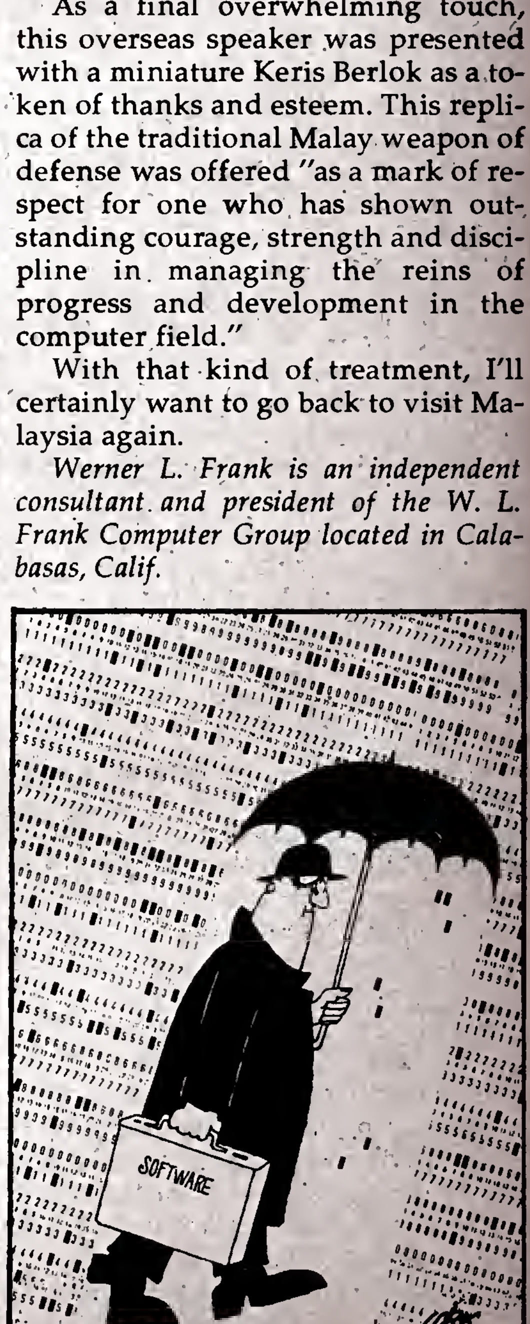
people viewed the exhibits.

The conference and exhibits were excellent. In organization and detailing, this conference easily equaled other professional conferences run by organizations with many more years of experience.

As a final overwhelming touch, this overseas speaker was presented with a miniature Keris Berlok as a token of thanks and esteem. This replica of the traditional Malay weapon of defense was offered "as a mark of respect for one who has shown outstanding courage, strength and discipline in managing the reins of progress and development in the computer field."

With that kind of treatment, I'll certainly want to go back to visit Malaysia again.

Werner L. Frank is an independent consultant and president of the W. L. Frank Computer Group located in Calabasas, Calif.



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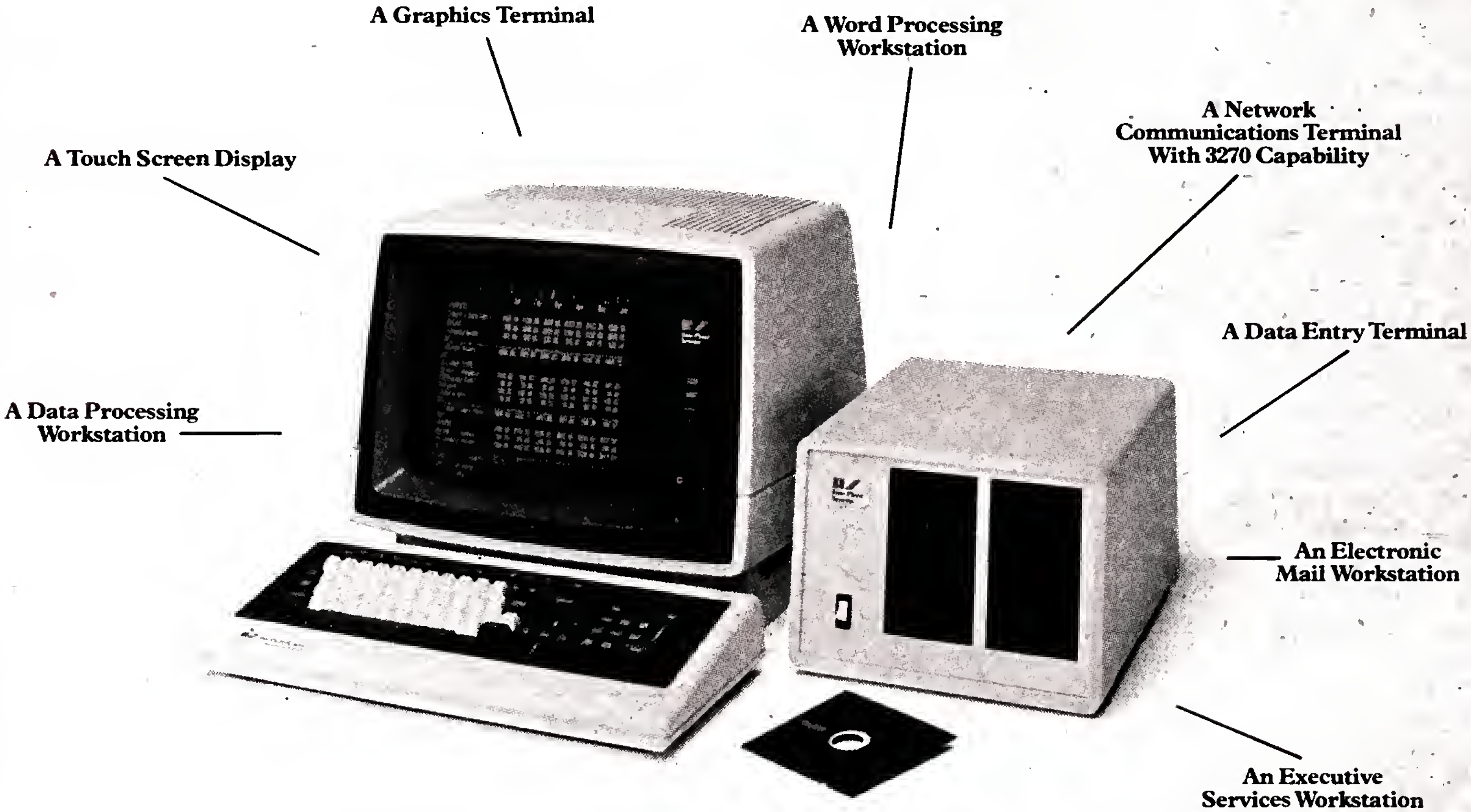
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Tominy Extends Data Base-Plus For IBM Systems

By Lois Paul
CW Staff

CINCINNATI — Tominy, Inc. last week rounded out the line of IBM systems supported by its Data Base-Plus data base management and application development software when it announced that the product now runs on the IBM 4300 series of mainframes, the System/34 and the Personal Computer.

The software was previously available only for the IBM Series/1 running under CPS. Tominy last week enhanced the package so that it now also runs under the Series/1's EDX operating system and supports the Data Base-Plus Programming Language.

Data Base-Plus provides application

(Continued on Page 32)

Consultant: IBM's ADF Either Loved or Hated

By Steven Pfrenzinger
Special to CW‡

Roughly five years ago, IBM offered a new installed user product called the Application Development Facility (ADF) which could generate IBM 3270-based applications in the IMS Data Base/Data Communications (DB/DC) environment.

Accompanied by confusing documentation and inadequate training, ADF hit the marketplace. Some of the early users reported substantial productivity gains, while others struggled with the simplest of applications.

Well, here it is four releases later and IBM has just released ADF II; and guess what? It is finally a fully supported program product with major enhancements, a whole new set of manuals and training tools. Thank you, IBM!

Let's reminisce for a while. From the early days of ADF and up to the current Release 1.3, you would find three basic opinions of ADF: those who love it, those who hate it and those who knew nothing about it. We will examine these opinions a little closer.

First, those who hate it. The IBM-supplied training certainly did not prepare you for using ADF, and the manuals were of little help. It had a list of confusing operands. It offered a fairly straightforward approach to generating a skeletal version of an on-line transaction. But just try to add a little logic to this skeleton program and you would see why programmers were resisting ADF.

The moderate to complex logic requirements were sticky going because of a field-level approach to triggering transaction logic. This technique had the programmers writing logic routines unique to each field processed in a transaction. These routines were then triggered at execution time by a series of operands that controlled the timing of execution, and whether the logic was to be performed

(Continued on Page 34)

Based on Goal's 'Phoenix'

Deltak to Offer Free CBT System

NAPERVILLE, Ill. — Deltak, Inc., a publisher of multimedia and computer-based training (CBT) programs for the DP industry, has announced it will offer a free presentation graphics system based on Goal Systems International, Inc.'s Phoenix CBT software system.

The Deltak Phoenix Presentation System (DPPS), which will be offered at no charge to its current customers, will allow users to run only Deltak CBT courseware, the vendor said.

The offering is part of Deltak's adoption of Goal's Phoenix as its standard authoring and presentation system. Deltak announced it will develop its own courses using Phoenix for both IBM mainframes and IBM Personal Computers. The firm will present its existing Deltak IIS/Deltavision courses that currently are based on IBM's Interactive Instructional System software on the Phoenix system.

The free presentation system, which runs on IBM mainframes, will be available early in the second quarter of 1983. Deltak's next step will be to offer an IBM Personal Computer 3270 emulation capability in September and an IBM Personal Computer stand-alone presentation system in April 1984. The vendor stressed that it will continue to support its customers using the Deltak IIS/Deltavision courses on mainframes and Micro/Deltavision courses on Apple Computer, Inc. Apple II

(Continued on Page 36)

'Auditec' Gets Cobol Converter

BOSTON — Carleton Corp. has announced that a Cobol file description (FD) Converter and optional interfaces to two data base management systems (DBMS) are included in an updated version of its Auditec Cobol source program generator.

Auditec, which runs on IBM and plug-compatible mainframes and Honeywell, Inc. machines with Cobol compilers, now includes an interface to Software AG of North America's Adabas and Cincom Systems, Inc.'s Total DBMS.

The Cobol FD Converter was designed as an enhancement to the Auditec Data Dictionary. It reportedly allows the user to add record definitions to the dictionary-maintenance program by having Auditec read Cobol source programs and/or copybooks directly. The FD Converter also is said to provide an automatic feature for handling duplicate or otherwise invalid item names. The vendor explained that Auditec will now automatically convert duplicate or illegal names to a legal format when they are added to the dictionary.

In addition to its interfaces to Adabas and Total, Auditec also can access files on IBM's IMS and DL/1 and Cullinane Database Systems, Inc.'s IDMS. The two additional interfaces will operate in the same transparent data base retrieval mode as the previously released interfaces, the vendor noted. Because Auditec was designed to generate the particular data manipulation language necessary to access the data base, the user reportedly can access data base files using the same commands used to read any other file. Simple or multiple record access is available on all Auditec data base interfaces.

Auditec is sold on a license-fee or a monthly rental-fee basis. Its base price is $17,500. The optional interfaces to Adabas and Total are available for an additional fee, from $5,900 to $6,900 each. Carleton is at 44 Bromfield St., Boston, Mass. 02108.

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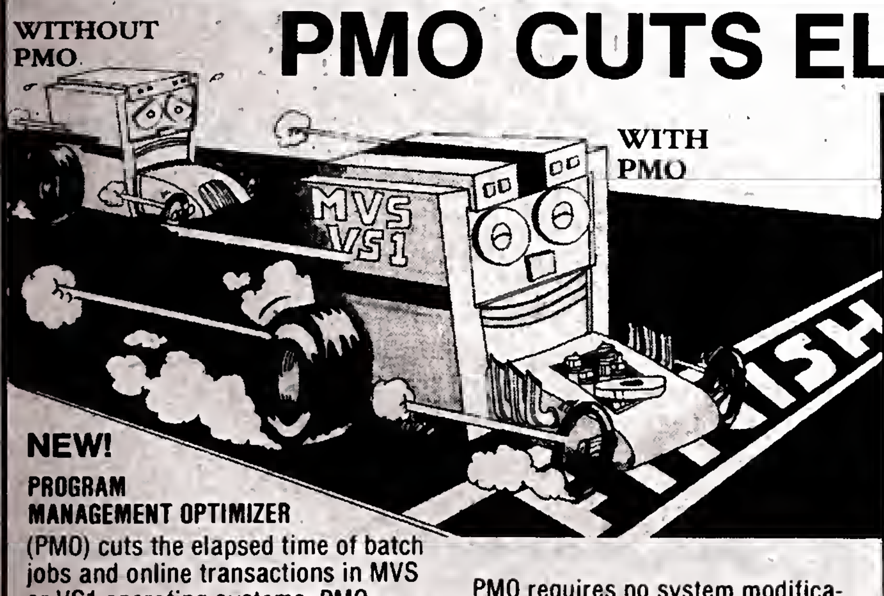

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Compiler Bows for System/34-Prime Migration

By Paul Gillin
CW Staff

PHOENIX — Database Systems Corp. has announced an RPG-II compiler that is said to enable IBM System/34 users to migrate RPG-II programs to Prime Computer, Inc.'s line of 32-bit virtual memory minis.

Escape/34 is aimed at System/34 users who are "dead-ended" by difficulties with system upgradability, a Database Systems spokesman said, adding that these users can migrate to Prime hardware without rewriting existing RPG-II programs. The compiler accepts System/34 RPG-II code and recompiles it for immediate use on Prime's upgradeable hardware.

Products similar to Escape/34 are being sold by other vendors to help disenfranchised System/34 users move to minicomputers from Digital Equipment Corp., Hewlett-Packard Co., Honeywell, Inc. and Wang Laboratories, Inc. IBM is believed to be readying a System/36 for release sometime this year.

The programs recompiled by Escape/34 can be used with the entire range of Prime products, including networking and communications software, and with relational data base management and on-line program development software marketed by Database Systems.

A Prime spokesman said the System/34 was targeted because of its estimated 60,000 installations in the U.S. "Ways to leave System/34 are pretty painful," he added. "It's a 10-year-old architecture with limited program size and memory."

IBM's migration path to the System/38 does not offer increased performance, according to the Prime spokesman, while the Prime offering allows migration up the entire Prime 50 series, from the low-end 2250, which supports up to 32 users, to the multistreaming 850, which handles up to 128 simultaneous users and includes 8M bytes of main memroy.

The product will be available Feb. 15 at a cost of $10,000 from Database Systems, Suite 201, 1846 E. Camelback Road, Phoenix, Ariz. 85016. Escape/34 will also be offered by Prime through its Solutions program, a cooperative marketing arrangement with independent vendors.

'Data Base-Plus' Now Runs On IBM Micro, 4300 Series

(Continued from Page 31)

portability up or down the IBM line, according to Tominy. George Pavloff, the company's executive vice-president and chief operating officer, explained that using the component products of Data Base-Plus "allows the IBM computer user to develop an application system once and transport that application without change to any other computer for which Data Base-Plus is available."

The component products of Data Base-Plus are a data base management system (DBMS), screen handler, print handler, query/report writer, utilities and the Data Base-Plus Programming Language. The DBMS reportedly features a logical structure for defining files; screen and print handlers that manage display or print devices; a Query/Report Writer; utilities; and a high-level programming language designed to integrate the component products and provide one form of data structure expression for programmers.

All of the component products have been implemented for each IBM machine environment, Tominy noted, and logical interfaces to the various operating systems have been designed into Data Base-Plus so the environments basically look the same to the user and the application program.

Data Base-Plus for the IBM 4300, 370 and 30 series of mainframes operates in DOS/VSE, MVS and OS/VS1 with CICS environments. It supports CICS, batch Cobol, assembler and the Data Base-Plus Programming Language and is priced at $39,000 for a single development system and $10,000 for the Data Base-Plus Programming Language.

On the System/34 under SSP, Data Base-Plus supports Cobol, Fortran, assembler and the Data Base-Plus Programming Language. It is priced at $19,500 for a single development system and $5,000 for the Data Base-Plus Programming Language.

For the IBM Personal Computer, Data Base-Plus runs under IBM's PC DOS and supports Basic, Cobol, Pascal, assembler and the Data Base-Plus Programming Language. Pricing is $5,850 for a single development system and $1,500 for the Data Base-Plus Programming Language.

Data Base-Plus for Series/1 machines under CPS or EDX supports Cobol, Fortran, assembler, PL/I, EDL and the Data Base-Plus Programming Language. It costs $19,500 for a single development system and $5,000 for the Data Base-Plus Programming Language.

Volume discounts are available, a Tominy spokesman noted from 4221 Malsbary Road, Building One, Cincinnati, Ohio 45242.

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For Sperry 1100 Mainframes

Release 8.4 of DCD II Unveiled

ROCKVILLE, Md. — CGA Software Products Group, Inc. has announced availability of Release 8.4 of DCD II, the Data Correlation and Documentation system for Sperry Univac 1100 series mainframe-class computers.

DCD II is designed to document Cobol programs and to aid in development, debugging and maintenance efforts, the vendor said. IBM/DOS and IBM/OS versions are also available.

Program-level documentation from DCD II reportedly replaces source and cross-reference listings produced by the Cobol compiler.

The new version includes a verb cross-reference report, which details Cobol verb usage at the program or system level, allowing identification of nonstandard verbs and verbs that will not be supported in Ansi Cobol 80. It also includes an 01 record report which, by summarizing record names throughout an entire Cobol system, helps the user define DCD II control cards.

Priced at $19,500, the system is available from the vendor at 1370 Piccard Drive, Rockville, Md. 20850.

BIM Bows CICS Tool

MINNEAPOLIS — B.I. Moyle Associates, Inc. (BIM) has announced a terminal data compression program for IBM CICS/VS systems running under DOS/VS, DOS/VSE, OS/VS1 and MVS.

The BIM Compress (BIMCMPRS) compresses 3270 terminal output transmissions by removing repetitive characters, a spokesman said. Reduction in transaction time typically varies between 10% and 60%, depending on the application and data entered. A CRT terminal transaction is provided with BIMCMPRS to display statistics on compression effectiveness during use, the vendor said.

The product costs $1,200 from BIM at 4355 Lyndale Ave. S., Minneapolis, Minn. 55409.

Insci System Targets Erisa

MONTVALE, N.J. — A pension administration system that assists pension managers in Employment Retirement Income Security Act (Erisa) compliance, employee benefits counseling and plan administration was announced by Information Science, Inc. (Insci).

According to the vendor, the Pension Administration System enables pension managers to comply with Erisa by ensuring that all eligible employees become pension plan members as soon as age and length of service and hour requirements are met.

The pension administration system is priced at $45,000, according to a vendor spokesman. It is an option to Insci's Human Resources System, which runs on systems from IBM, Honeywell, Inc., Burroughs Corp. and other vendors and is priced separately. The vendor is located at 95 Chestnut Ridge Road, Montvale, N.J. 07645.

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Report Generator Provides Link to 'Soloman'

PHOENIX — Information Systems Consultants, Inc. (ISC) has announced a report generator for Honeywell, Inc. mainframes that provides an interface to ISC's Source and Object Library On-Line Manager (Soloman).

MRS (Management Reporting System) runs on Honeywell Level 66, Level 66/DPS and DPS 8 systems under Gcos III or Gcos 8 operating systems. The menu-driven generator prompts the user for reports and parameters required to produce reports, a spokesman said.

Included are reports listing each project under the Soloman structure; reports listing all programs which changed during a defined period; reports listing programs meeting specific criteria, including programming language, type, associated copy libraries and responsible ownership; reports providing a summary of the number of files residing within each Soloman structure; and reports listing the individual member attributes for each Cobol-74 random library created through Soloman.

Users can determine percentage of completion on a project, amount of time required to develop programs, programs requiring excessive maintenance and programs referencing a common copy library, the spokesman said.

Software requirements include any standard Gcos release; Soloman Release 2.0, 2.1 or 2.2; time-sharing; and appropriate communications software. MRS resides and executes in 15K-byte words of time-sharing memory.

MRS is available on a license basis for $2,500 with an annual maintenance fee of $400 from ISC, located at 6812 N. 19th Ave., Phoenix, Ariz. 85015.

Consultant Lists ADF Pros, Cons

(Continued from Page 31)

conditionally or unconditionally. Later I will describe a very simple technique to replace this one.

ADF is a very powerful tool, but it simply has too many options, too few standards, until recently, and poor documentation and training. It has taken years for structured techniques and standards to evolve that will improve the quality, performance and maintainability of ADF-developed systems.

For those who swear by, rather than at, ADF, there appears to be a similarity of use. Generally, the installations that are having the greatest benefit from ADF have done the following:

- Established an ADF administrator position to control its use.
- Set up standards and procedures that address design, source management, rule generation, move-to-production, testing and so forth. In many cases, these standards enforce the use of a subset of available ADF rule operands and features.
- Created an in-house training course and paid the price of the learning curve.
- Conducted a pilot project at the beginning of every major development effort to acquaint the programmers with ADF.
- Hired an experienced ADF developer to guide the installation's initial effort.

For the ADF installations that are doing all the right things, the productivity gains are impressive. First time developers are reporting 2:1 improvements in productivity and as high as 10:1 on second and subsequent development efforts. The hidden nightmare of maintenance is also reduced. Moving maintenance programmers from one ADF-developed system to another is workable because, architecturally, they are almost all the same and the components are very predictable when changed. In addition, the need for changes is greatly reduced because a major portion of the executed code is contained in precoded and pretested common modules whose correctness have long since been proven.

Benefits Substantial

The benefits of a controlled and standardized use of ADF are obviously substantial and for those who love it, ADF II must seem too good to be true. Its enhancements include a Data Dictionary Extension; IMS/VS 1.2 data sharing support; fast path DB support; multihost environment support; twin segment processing; Cobol support; and screen handler improvements.

ADF is an extremely powerful development tool that if used properly can develop the most complex IBM 3270-based systems currently under consideration, with great improvements in productivity and substantial reductions in maintenance costs.

One notable technique used in two successful ADF development efforts was the elimination of the field-level approach to triggering logic and its replacement with a transaction-level (single trigger) approach to initiating logic. This means that the single field will unconditionally initiate logic at various stages of a transaction (prescreen or postscreen) that pertains to the entire transaction, not just to an individual field. This technique completely eliminated the numerous problems listed before and reduced the learning curve substantially because the concept is simple and more like the traditional programming approach.

Finally, we come to the last opinion, those who know nothing about it. Well, for those in IMS DB/DC development, this number will soon be getting smaller as more and more IMS installations begin, or expand, their use of a product that has finally come of age.

Pfrenzinger, a computer software consultant who specializes in IMS DB/DC applications, is on the staff of IMS Consulting, Inc. in Northridge, Calif.

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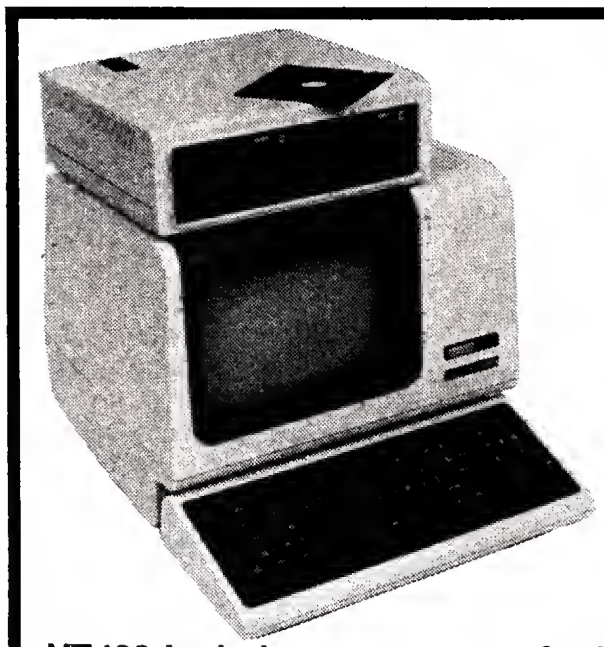

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IBM Unwraps Updates For System/38 SNA/SDLC

RYE BROOK, N.Y. — IBM has unwrapped a series of communications enhancements for its System/38 that are said to improve its Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) capabilities and to make it compatible with the IBM 3270 CRT terminals.

The firm also introduced a programming enhancement called the System/34-to-System/38 Conversion Aid that reportedly increases the amount of code converted automatically, reducing the amount of user programming required. In addition, IBM announced:

- A high-speed remote line attachment enhancement that permits the System/38 to communicate with an IBM 3705-11 communications controller.
- More than 50 Release 5.0 upgrades for System/38 licensed programs.

The SNA/SDLC capability for the System/38 is provided by a package that permits program-to-program communications between System/38s, as well as between a System/38 and 370 and between 30 series and 4300 processors when running under CICS/VS, a spokesman noted.

Other Enhancements

Other SNA/SDLC enhancements include SNA alert, which allows System/38 operators to notify host computer operators of any system problems, and an upgrade to the System/38's Remote Job Entry Facility (RJEF) that enables the system to operate as a workstation submitting jobs to a host 370, 30 series or 4300 CPU running under the SNA/SDLC protocol. Until now, this capability was only available under Binary Synchronous Communications (BSC).

The 3270 emulation is available via a utility program that lets the System/38 emulate 3270 display stations and printers through its CPF operating system. With the utility, the System/38 communicates with the host as though it were a 3271 Model 2 display station, while its printers appear as 3284, 3286 and 3288 Model 2s.

The emulation capability allows users who have invested heavily in 3270 applications programs to incorporate a departmental or distributed System/38 into their BSC systems easily and less expensively, IBM said.

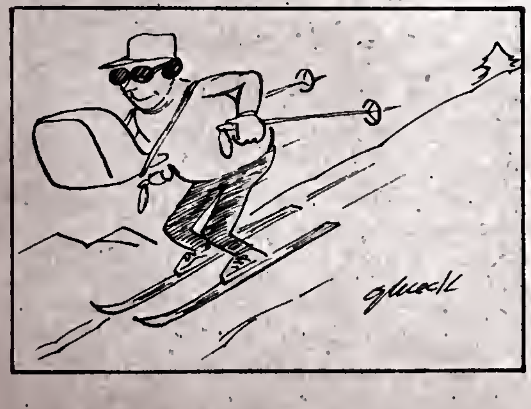
The high-speed remote line attachment enhancement for the System/38 allows it to communicate with an IBM 3705-11 communications controller at 57,600 byte/sec locally or with a 3705-11, 4331 communications adapter or another System/38 at 56,000 byte/sec remotely.

The line attachment feature, which adheres to the CCITT V.35 interface standard, costs $560 and has a monthly lease charge of $20 and a monthly maintenance fee of $5.

Finally, IBM unveiled several Release 5.0 upgrades for System/38-licensed programs.

The System/34-to-System/38 Conversion Aid kit carries a one-time charge of $1,625. The 3270 emulation package and all Release 5.0 enhancements are part of the CPF operating system, which has been increased in price by 10% to $16,500.

All enhancement packages will be available by August with the exception of RJEF, which will be incorporated as part of the CPF operating system, an IBM spokesman said from 900 King St., Rye Brook, N.Y. 10573.



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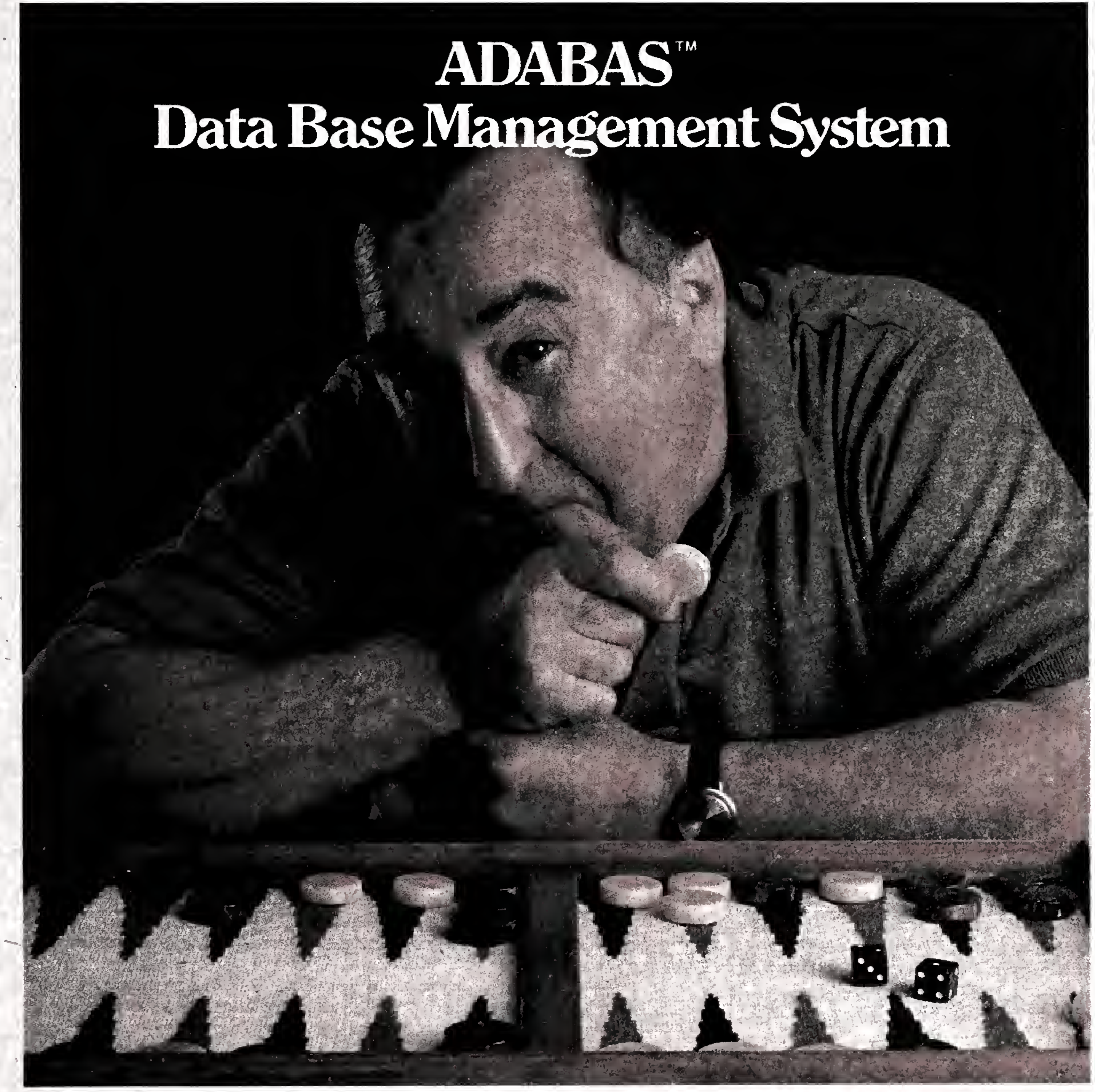

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Spreadsheet Fits Unix, VAX

PALO ALTO, Calif. — An electronic spreadsheet program designed to operate in the Bell Laboratories Unix environment on Digital Equipment Corp. VAX-11 machines has been developed by Logitech, Inc.

Logiplan was designed as a tool for solving financial and business problems. Logiplan reportedly allows the user to: integrate into a time-sharing environment; temporarily suspend execution to access other features of the system; and split the screen into nine windows.

Also available in French and Italian, Logiplan costs $1,750. More information is available from Logitech at 165 University Ave., Palo Alto, Calif. 94301.

Claims 80% Reduction

Designer Cuts Processing Time

ANN ARBOR, Mich. — Database Design, Inc. has announced Release 2.5 of its Data Designer, said to provide an 80% reduction in processing time compared with previous versions of the product.

Running on systems from IBM, Burroughs Corp. and Sperry Univac, Data Designer is said to help develop data bases by automating the production of Logical Data Models in third normal form from individual user requirements.

The Logical Models are used to design physical data bases for such data base management systems as Applied Data Research, Inc.'s Datacom/DB; Cullinane Database Systems, Inc.'s IDMS; Cincom Systems, Inc.'s Total; and others, according to the vendor.

Existing clients will receive Release 2.5 free. For new customers, Data Designer will cost $30,900 until March 1, when the price will rise to $35,000, a spokeswoman said from 2020 Hogback Road, Ann Arbor, Mich. 48104.

Deltak Offers CBT System Free to Current Customers

(Continued from Page 31)

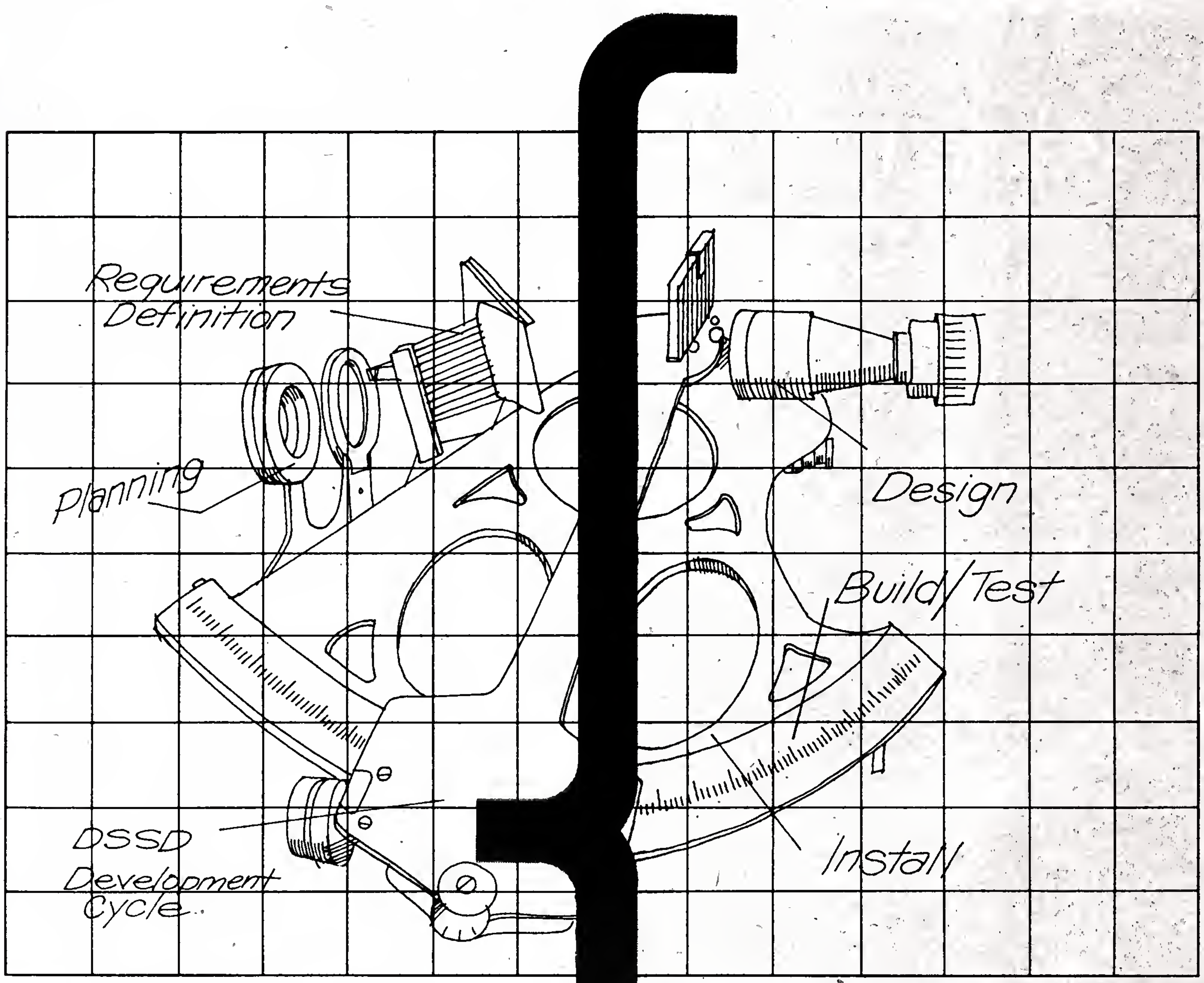
microcomputers.

The DPPS system is intended to enable any DP organization with an IBM mainframe or Personal Computer to use Deltak's CBT/Deltavision library. Formerly, the Deltak courses on the Apple II and IBM mainframes were two completely separate systems.

"Whatever you develop on the mainframe is downward-compatible," according to Rich Ream, vice-president of marketing operations for Deltak. He explained that this will enable Deltak to explore the needs of end users who are making use of information center and application development center tools and who therefore require training on these packages.

Once users bring in DPPS, they can then bring in Goal's Phoenix presentation system to run non-Deltak courses, Ream continued. The Phoenix presentation system will handle any courseware running under IBM's IIS. Then if users want to modify or customize their courseware, they can add Goal's Easy Authoring System for Education (Ease) authoring language, he added.

The Phoenix system, including Ease, will continue to be marketed by Goal Systems, which is based at 5455 N. High St., P.O. Box 29481, Columbus, Ohio 43229. The Deltak Phoenix Presentation System will only be available from Deltak, which is located at 1751 W. Diehl Road, Naperville, Ill. 60566. The courses available via the DPPS system will be priced on a subscription basis, similar to the pricing structure for other Deltak courses.



The Bracket, a navigational tool for software developers

Without proven navigational procedures the great polar ice caps would never have been explored, nor the mighty oceans conquered. System developers today often face unknowns equal to those of yesteryear in developing complex application software. Data Structured Systems Development (DSSD™) is the software designers' sextant for charting the course through the application maze.

There are four powerful reasons systems development managers should use a data structured methodology, the proven path to a greater system effectiveness. They are:

- Increased user satisfaction
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Take the time to analyze your needs in terms of these benefits. You will then discover why application software managers at major organizations, like St. Regis Paper Company, Best Products, Northern Telecom Inc. and Tektronix, Inc. are using Ken Orr's DDSD™ methodology. There are several easy ways to get started.

- Training: public or in-house seminars/$810 for a 5-day public course
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- DSSD Design Library: a 7-volume reference guide/$23,500
- *Structured Requirements Definition* by Ken Orr/ $25 — limited supply offered FREE until March 31, 1983

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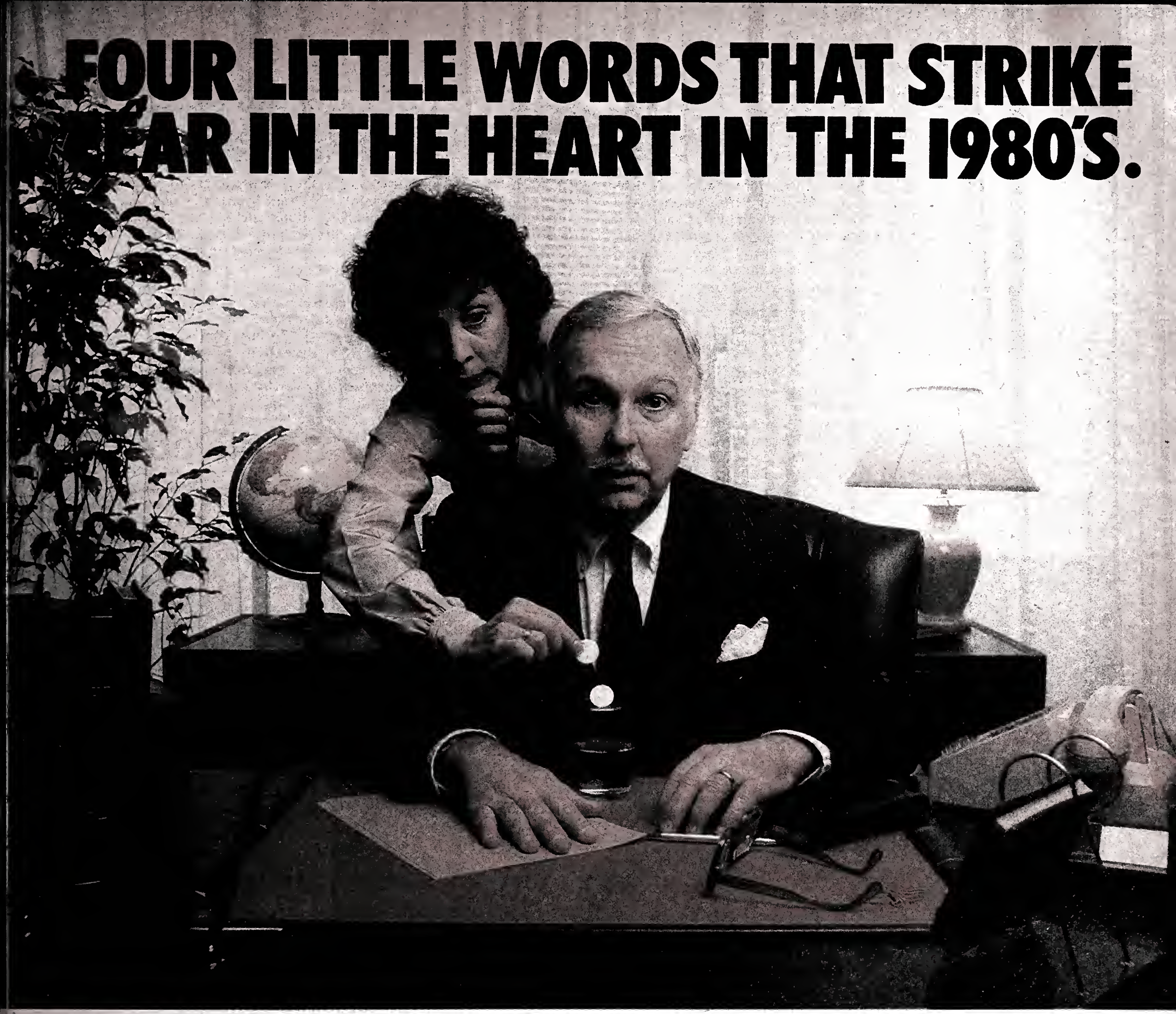

"The computer is down."

Every day another business goes "on line." Every day the world becomes more dependent on computers. And every day it becomes more important for the world to have a computer that won't go down, or even skip a heartbeat.

Over the past decade there have been computers designed to withstand hardware failures and eliminate downtime. However, all previous approaches depend heavily on software techniques to provide fault tolerance. A comparison of these old systems with the new Stratus/32 Continuous Processing™ System will illustrate how far we have come in one leap, by using advanced hardware technology instead of complex software.

How the Stratus Hardware Solution Supersedes the Software Solutions.

Stratus's hardware design means that fault tolerance is invisible to your application programs and users. You can even move previously developed applications to Stratus with NO CHANGES and NO PERFORMANCE LOSS for fault tolerance. In contrast, the software-based systems require complex, performance-stealing software in order to implement fault tolerance. This means that new programs are more difficult to develop, they run slower, and existing programs can't be run without major changes.

An added benefit of the Stratus fault tolerant design is that you can expand your system with additional processors as your computing needs grow. In fact, you can have up to 32 fault tolerant processors, 2000 communication lines, and 100 billion bytes of storage in a single Stratus system.

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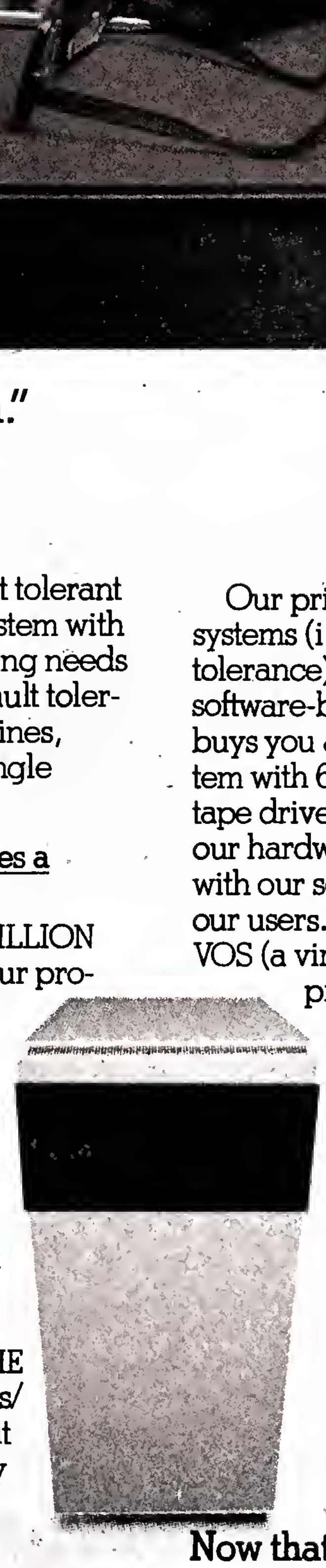

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'Procxref' JCL Utility Gets ICCF Support

SANTA CLARA, Calif. — Software Assistance has added IBM Interactive Computing and Control Facility support for Procxref, a report utility for JCL and catalogued procedures.

JCL statements for IBM DOS/VS(E) installations can be listed, summarized and cross-referenced directly from system or private source statement libraries or from the DOS/VS(E) procedure library. Input from other sources can be processed by using the user exit facility. Exit programs can be generated by using a macro distributed with Procxref.

The utility produces a listing of all procedures selected and a number of cross-reference reports for the different types of JCL statements contained in those procedures, a spokesman said. Cross-references are created for phase names, file names and file identifications. Each report is user selectable and contains all of the categories and formats needed for analysis and control of procedures and job streams.

The program can be initiated from either Sysin or Syslog. Run-time options include the source of input statements, procedures to be selected or rejected and the types of reports and cross-references desired. Global selection or rejection of any or all procedures may be specified. The sort program is loaded and used internally to resequence the information to be cross-referenced.

The utility costs $1,200 from Software Assistance, P.O. Box 2101, Santa Clara, Calif. 95055.

SSP Software Component Released

ANN ARBOR, Mich. — Holland Systems Corp. has released the software component of its Strategic Systems Planning (SSP) product, a methodology for integrating a set of corporate data bases.

SSP software is said to reduce the man hours required to develop the necessary details of a business model.

SSP software runs on IBM or IBM plug-compatible mainframes under MVS. The price for the entire SSP product, which includes the SSP software, education and training, a procedural methodology and software documentation, is $60,000. The vendor is located at 3131 S. State St. S-303, Ann Arbor, Mich. 48104.

Modeling System Debuts

VANCOUVER, B.C. — A menu-driven, fully integrated modeling and reporting system and a spreadsheet program for the VM/CMS operating system in IBM and Amdahl Corp. environments have been developed by Canadian European Systems Ltd.

Dainev is the modeling and reporting system and VZplan is a visually oriented automated spreadsheet system. The products can be used as stand-alone systems or in conjunction with each other.

Dainev/VZplan reportedly can be applied to any spreadsheet format analysis or report. Licenses cost $16,000 (U.S.) with trial periods available from the firm through P.O. Box 2884, Vancouver, B.C., Canada V6B 3X4.

'Xbol' Update Announced

CLEMMONS, N.C. — David Eargle Software Products, Inc. has announced Release 2.0 of Xbol, a programmer productivity aid for Cobol programs operating under IBM 370-era software.

Release 2.0 offers a report writer and will automatically generate file matching and control break logic.

The new release also features automatic generation of program documentation, which consists of sample reports, record layouts and sample on-line screen definitions, the vendor spokesman for the firm explained.

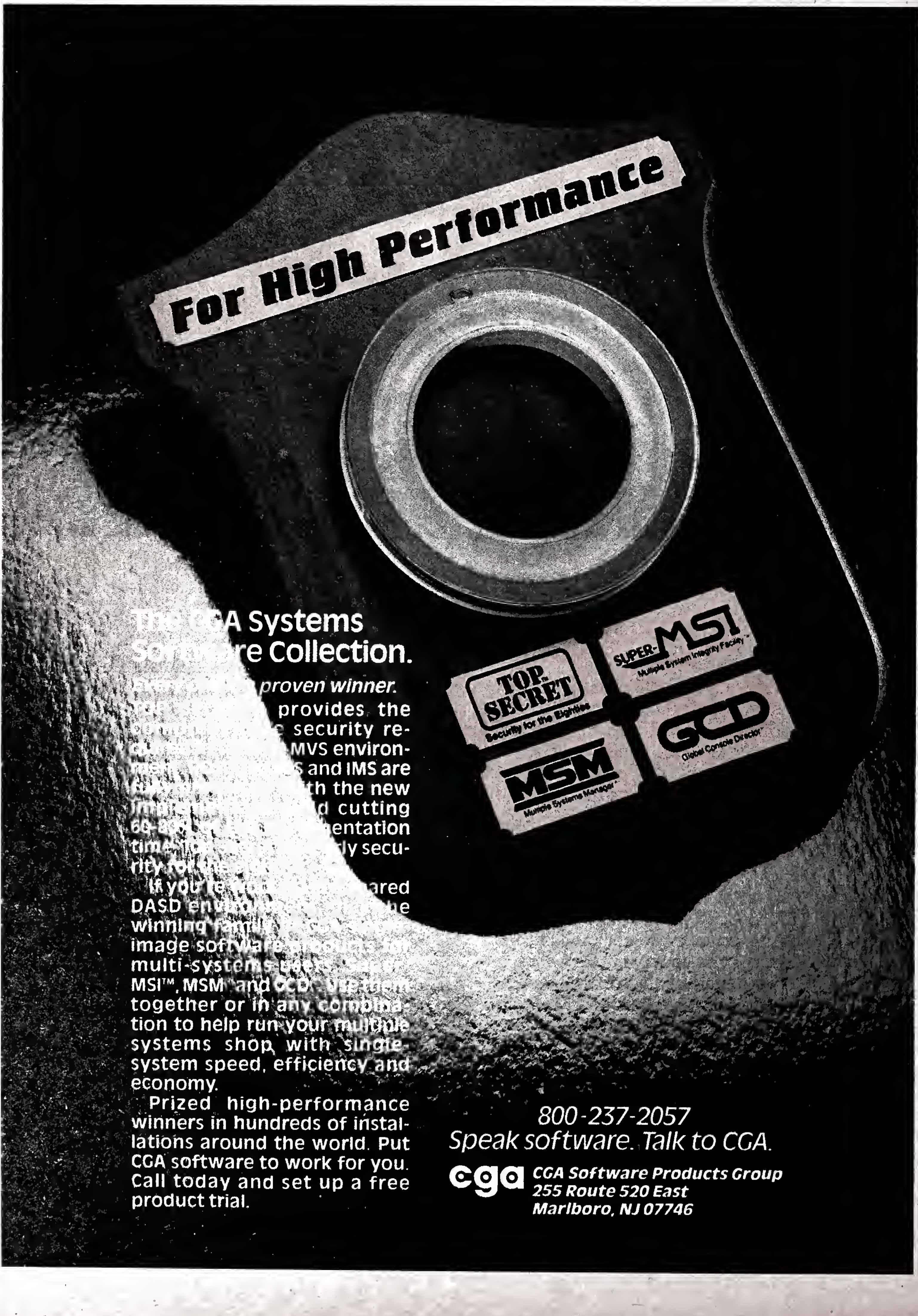
A permanent license for Release 2.0 of Xbol costs $20,000 through P.O. Box 1196, Clemmons, N.C. 27012.

'Action' Version Out For IBM System/38

DALLAS — CTI Limited, Inc. has released a version of its Action general ledger software for the IBM System/38.

The package reportedly includes the capability to define reporting structures to produce reports independent of the account structure, unlimited budget capabilities, multiperiod processing, multiple books including cash and accrual books, intercompany capabilities, level/center concept with parent/child relationship that can vary with the reporting structure, cross-over into the 21st century, native RPG-III, data base and Help screens.

The license fee is $10,000 from Suite 810, 4455 LBJ Freeway, Dallas, Texas 75234.



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For Honeywell CPUs Under CP-6

SIR/DBMS Version Announced

EVANSTON, Ill. — Scientific Information Retrieval, Inc. (SIR) has announced a version of its SIR/DBMS data base management system for Honeywell, Inc. computers under the CP-6 operating system.

SIR/DBMS provides data editing and checking facilities, data security and direct interfaces with statistical packages such as SAS Institute's SAS, SPSS, Inc.'s Statistical Package for the Social Sciences and the University of California's BMDP biomedical package.

SIR/DBMS features a data definition and retrieval language, report generator, integrated text editor and report and table production facilities. Data bases are portable across all computers that support SIR/DBMS, a spokesman said.

A Table procedure is included for displaying data in camera-ready, tabular forms. The procedure reportedly displays frequency cross-tabulations for discrete data and statistical breakdowns for continuous data. Table cell statistics include counts, totals, means, minimums, maximums and others.

SIR/DBMS also operates on IBM and plug-compatible mainframes under OS, TSO and VM/CMS; Control Data Corp. Cyber under NOS and NOS/BE; Sperry Univac 1100 and 90; Digital Equipment Corp. VAX; Prime Computer, Inc. systems; Perkin-Elmer Corp. 32; Siemens Corp.; and the ICL, Inc. 2900 series.

The license fee is $18,000 for the first year with an annual renewal and maintenance fee of $4,650 through P.O. Box 1404, Evanston, Ill. 60204.

Tabulation System Runs on Wang VS Series

ARLINGTON, Texas — Decision Analyst, Inc. has announced an interactive tabulation system for survey research data that runs on the Wang Laboratories, Inc. VS series of computers.

Called Icion, the package is a screen-based, menu-driven, multitasking system that features Boolean logic to define a flash, a stub, a bannerpoint, a table base or a global filter for all cross-tabulations, a spokesman for the company claimed.

Icion produces standard survey research tables and can handle unlimited numbers of respondents, questions and banners. The system accepts single-response, multiple-response and numerical value survey questions.

Wang's word processing can be used to copy, edit and add text to tables created by Icion, the vendor claimed. The system also offers complete stub and banner annotation, univariate statistics, ranking and answer weighting. Summary tables of sums and averages can be created to simplify the analysis of survey data.

The package is priced at $25,000 from Suite 214, 2225 E. Randol Mill Road, Arlington, Texas 76011.

Math Package Offered For FPS-164 Processor

PORTLAND, Ore. — Floating Point Systems, Inc. has announced a library of fast matrix algebra routines for the company's FPS-164 Attached Processor. The processor attaches to Digital Equipment Corp., IBM and Sperry Univac systems for offloading and processing computationally intensive engineering and scientific jobs.

Fast Matrix Solutions Library (FMSLib) routines are coded to allow the FPS-164 to solve matrix problems at the theoretical speed of the hardware, a spokesman said. The routines also use asynchronous disk data transfers to operate on rows of the matrix as if the entire matrix were in main memory. The feature is intended for matrices too large to fit in main memory. FMSLib is divided into four segments. Each can be purchased separately. A permanent license fee for the first segment puchased is $15,000 with each additional segment priced at $5,000.

A segment providing fast utilities for finite element work called Fast Finite Element Library also costs $5,000.

The products will be available in July through P.O. Box 23489, Portland, Ore. 97223.

Tapes Linked To DBMS

ENGLEWOOD, Colo. — Automated Quill, Inc. has announced that marketing tapes such as Dun's Marketing Services tape can now be interfaced with Superenglish IX, its data base management system for Data General Corp. systems.

The software module that supports the interface reportedly allows marketing materials on magnetic tapes to be used by the Superenglish IX product. Superenglish IX incorporates a criteria selection and sort capability followed by report and mailing label generators.

The module costs $950. Further information can be obtained from the vendor, which is located at 3501 S. Corona St., Englewood, Colo. 80110.

VAX-11 APL Introduced

MAYNARD, Mass. — Digital Equipment Corp. has announced an implementation of APL for its VAX-11 minicomputers said to have a theoretical work space limit of 4G bytes.

VAX-11 APL runs under the VMS operating system. VAX-11 APL has a mathematical format and is suited for handling tables and lists in such environments as banking, insurance, laboratory research and engineering.

By integrating VAX-11 APL with the VMS operating system, the new implementation reportedly can read and write sharable files, both sequential and relative, that can be used by programs in other VAX languages.

Other languages include VAX-11 Fortran, Basic, Cobol and C.

The software costs $13,800, according to a spokesman for the vendor. DEC is located at 146 Main St., Maynard, Mass. 01754.

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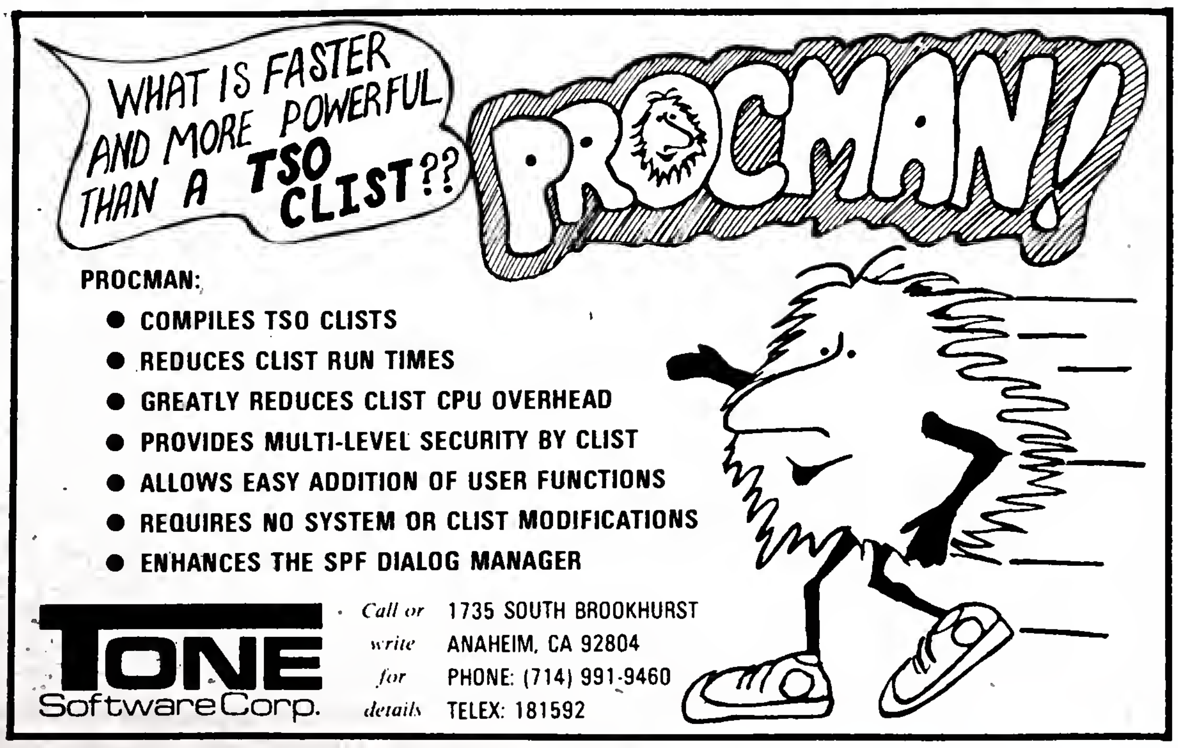
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Receivables Package Out for System/38

JACKSON, Mich. — Alro Computer Software Services has announced an open-item accounts receivable system designed for the IBM System/38.

Receivables/38 is a menu-driven system that reportedly provides complete interactive processing modules for file maintenance, credit inquiry, entering invoices and applying cash received, according to a spokesman for the vendor.

Provisions are made for batch interfacing of invoices from existing billing to order entry systems, according to the spokesman for the vendor.

Reporting functions are available including detailed account statements, aged trial balances and status of accounts, the vendor spokesman maintained.

Receivables/38 is available for a one-time license fee of $3,450, the vendor spokesman said.

Alro is located at 3100 E. High St., P.O. Box 927, Jackson, Mich. 49204.

'Global Limits' Targets Banks

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco) has unveiled a product which helps international banks control their money market and foreign exchange exposure.

The Global Limits System continuously consolidates and updates worldwide limit and exposure information, provides dealers with information on current available amounts under the limits and offers other management information, a spokesman said. Each user defines the type and structure of trading limits. Typical risk areas covered include customer and country credit exposure and foreign settlement risk.

Inquiries can be made on specific limits or the proposed transaction can be entered on a trial basis to determine whether limits will be exceeded, the spokesman noted. If a proposed deal exceeds any limits, further inquiries allow formation of alternative trading options. The system also provides daily reports of countries and customers exceeding their global limits.

The Global Limits System runs on Geisco's Honeywell, Inc.-based Mark III service. A one-time license fee costs $200,000, the spokesman said from 401 N. Washington St., Rockville, Md. 20850.

Icis Service Enhanced

TORONTO — I.P. Sharp Associates Ltd. has added oil, chemical and petrochemical statistics to its on-line data base service.

The new services include *Petroleum Intelligence Weekly* (PIW) Key Crude Prices, PIW Key Crude Oil Production and PIW Spot Product Prices. To access the information, customers must subscribe to PIW at an annual cost of $975.

The Independent Chemical Information Services Ltd. (Icis) data base provides market activity information for chemical and petrochemical product groups, a spokeswoman said. The data can be accessed as a written report or as numeric data. There is no additional charge for the service for current Icis subscribers, but other users must pay an annual charge of from $750 to $1,500, according to the spokeswoman.

Other energy data bases include American Petroleum Institute and U.S. Department of Energy data on production, imports, stocks and consumption of oil and other energy sources, the spokeswoman said.

Charges for use of the I.P. Sharp time-sharing service are $1/hour connect time, 25 cents to 45 cents per CPU and 70 cents per 1,000 characters transmitted or received.

I.P. Sharp is located at Suite 1900, 2 First Canadian Place, Toronto, Ont., Canada M5X 1E3.

'Ansys' Out For Domain

CHELMSFORD, Mass. — Swanson Analysis Systems, Inc.'s Ansys finite element analysis software for engineers is now available for Apollo Computer, Inc.'s Domain Processing System.

Ansys is currently available on Control Data Corp., Cray Research, Inc., IBM and other mainframes, as well as Prime Computer, Inc. and other minicomputers.

The software is said to make possible a choice of types of analysis, material behavior, loading conditions, nonlinear options and solution procedures. Ansys costs $1,500/mo for less than five nodes and $2,000/mo for five to 10 nodes from 19 Alpha Road, Chelmsford, Mass. 01824.

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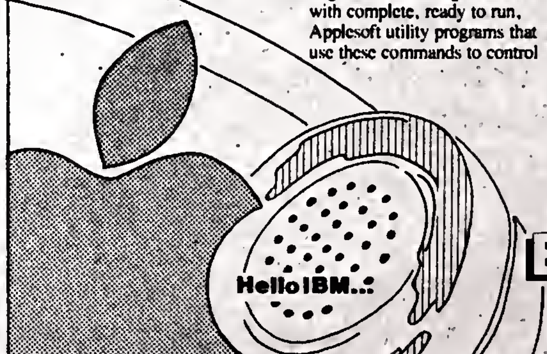
Ergolinx extends Applesoft basic to include special data communications and file handling commands. Ergolinx comes with complete, ready to run, Applesoft utility programs that use these commands to control transmission and reception of your files. Each utility program displays a selection menu and prompts you through complete file transfer sessions. You can use these utility programs as supplied, or you can copy them and modify them to suit your own requirements. Even create your own unique intelligent 2780/3780 terminals by programming new Applesoft routines.

Ergolinx runs under standard DOS 3.3.
Ergolinx runs without an extra RAM card or a different operating system. All you need is a 48K Apple II Plus with DOS 3.3, a synchronous modem, and another computer system that supports 2780 or 3780 bisync communications. Ergolinx comes with a synchronous communications card, a floppy disk of programs, and a user's manual. For more information, call or write:



Ergonomic Software

Ergonomic Software Inc.
Attn. Carol Williams
P.O. Box K
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212 427.2373

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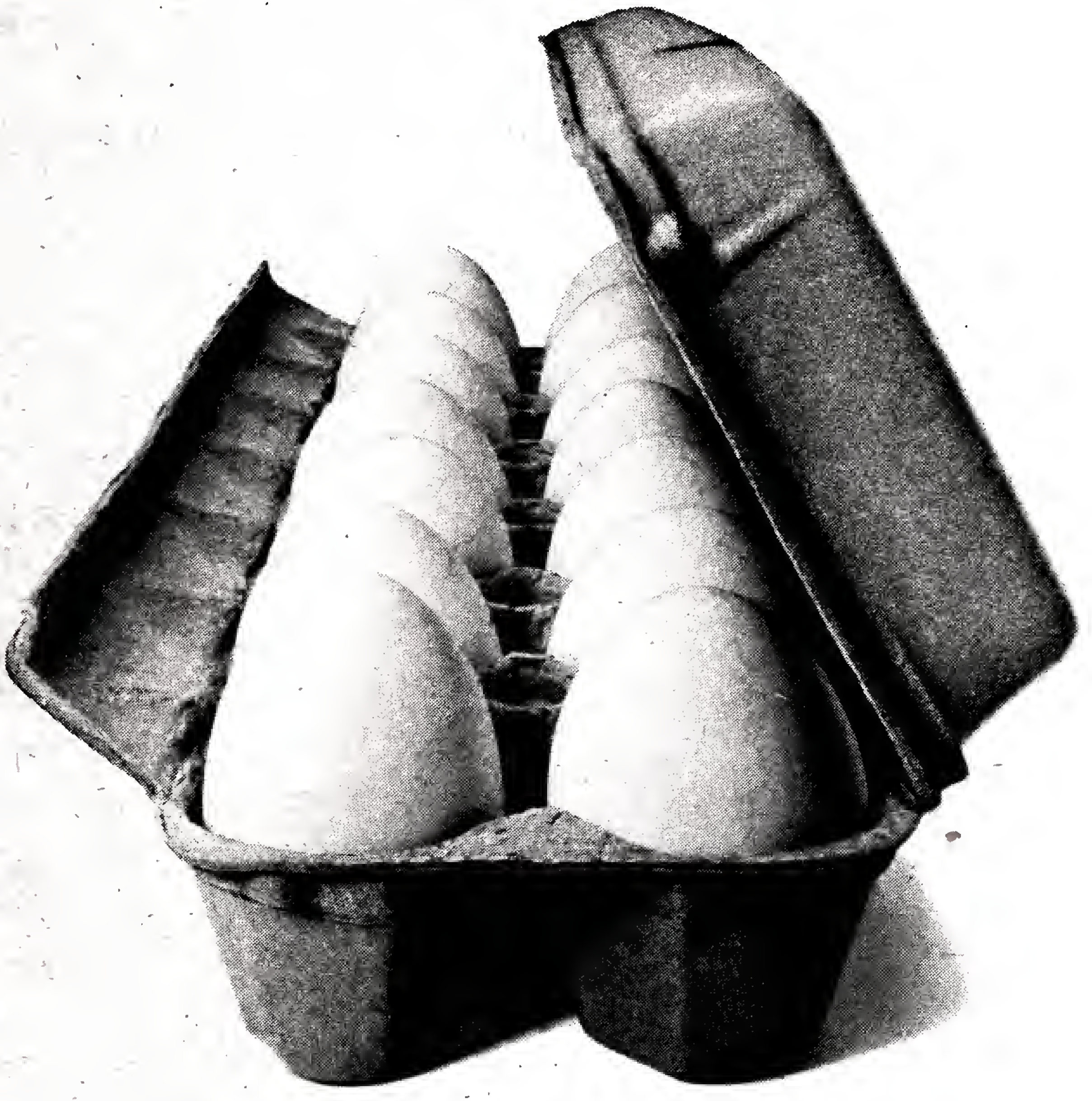

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Random Notes

Real-Time MSP/68000 OS Now Offered 'A La Carte'

BOSTON — Hemenway Corp. is now offering the individual components of its Real-Time Multi-Tasking System Program (MSP)/68000 OS on an "a la carte" basis.

Hemenway offers the following system software components: Nucleus, File Manager, Command Line Interpreter, Device Drivers, Assembler, Text Editor, Linker, Basic and Forth Interpreters, Real-Time Debugger and a range of system utilities.

The price for a real-time data acquisition system, for example, composed of the Nucleus, Real-Time Debugger, Device Drivers and the File Manager is $15,000. The firm is located at 101 Tremont St., Boston, Mass. 02108.

PAC 1, Version 2 Unveiled For DEC's VAX, PDP-11

KING OF PRUSSIA, Pa. — International Systems, Inc. has announced PAC 1, Version 2, an interactive project management system for Digital Equipment Corp. PDP-11 computers running RSTS/E and RSX-11M, VAX under VMS and Decsystem-20 computers running Tops-20.

Pac 1 is designed for project planning and management, resource requirements planning, project budgeting and costing. It includes report writer and printer graphics subsystems.

The software costs $20,000 from International Systems at 890 Valley Forge Plaza, King of Prussia, Pa. 19406.

Automated Claims System Announced for Datapoint

CONCORD, Calif. — An automated claims processing system for Datapoint Corp. computers has been announced by C.R. Wiesner & Associates, Inc.

System V reportedly handles medical, dental, vision, prescription drug, disability and workers' compensation functions. The construction of the data base and support programs is said to give the user the capability to design and maintain processing modules, according to a vendor spokesman.

Through June, the system is being offered at an introductory 50% discount. After that time, the price will range from $150,000 to $250,000, the vendor spokesman said from 1430 Willow Pass Road, Concord, Calif. 94524.

Two Self-Installing Tools Offered for System/23, /34

SOUTHFIELD, Mich. — Intro-Logic, Inc. has announced two self-installing manufacturing packages for the IBM System/23 Datamaster and System/34. Both products come in versions for process and repetitive environments.

The packages cost $5,000 for the System/23 version and $7,000 for the System/34 model. Demonstration packages are available for both versions at $50 for the System/23 and $100 for the System/34.

A discount is offered for quantity purchases, and a dealer program is available for third parties. Intro-Logic is located at 24700 Northwestern Highway, Southfield, Mich. 48075.

Equipment MIS Designed For Fleet Maintenance

WINTER PARK, Fla. — An Equipment Management Information System (Emis) for fleet owners and operators is available from Fleet Management Systems, Inc.

Emis is said to monitor and report on equipment, inventory, fuel, repairs, finances, preventive maintenance and shop productivity. The system reportedly indicates operating costs by the vehicle, the mile, the month and the operator.

Emis is designed for IBM 370 and 4300 and compatible systems but reportedly will run on any computer with 64K bytes of core memory and a Cobol compiler. Emis costs $50,000 from Suite 200, 147 W. Lyman Ave., Winter Park, Fla. 32789.

ADS' Manufacturers Tool Unveiled for HP 1000, 3000

COLORADO SPRINGS, Colo. — Advanced Data Systems, Inc. has announced the Manufacturers Information Management System (Mims) package for the Hewlett-Packard Co. HP 3000 and HP 1000 systems.

Mims applications include estimating, order processing, production management, inventory control, work scheduling and payroll.

The package costs between $40,000 and $60,000, depending on modules selected. The vendor is located at Suite 105, 3604 Galley Road, Colorado Springs, Colo. 80909.

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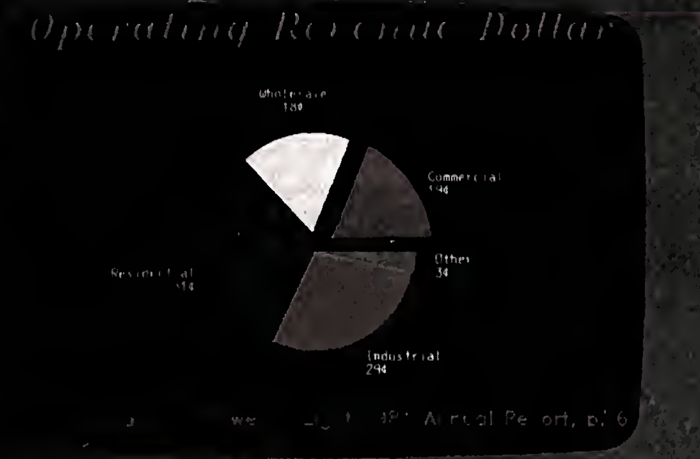
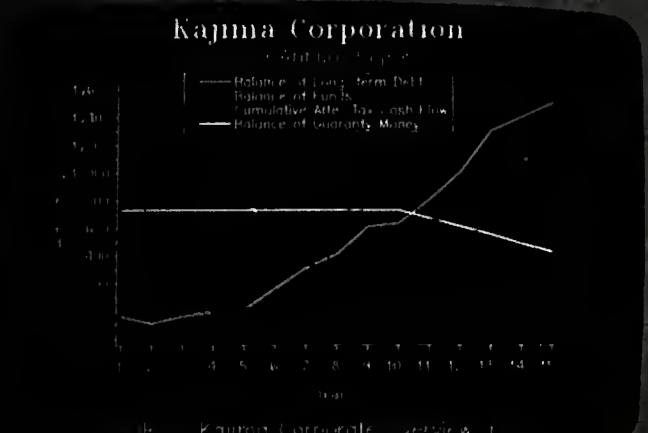
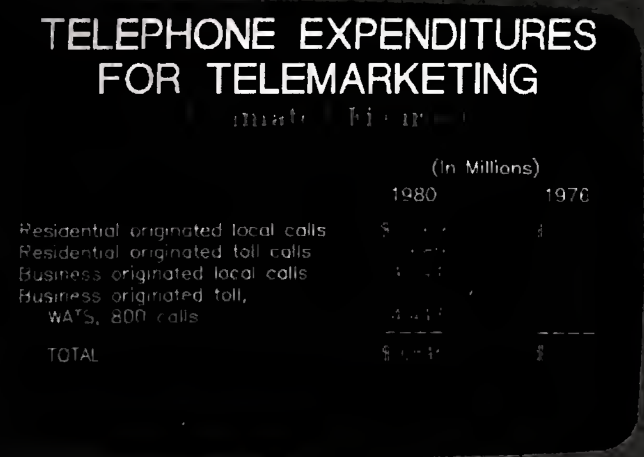


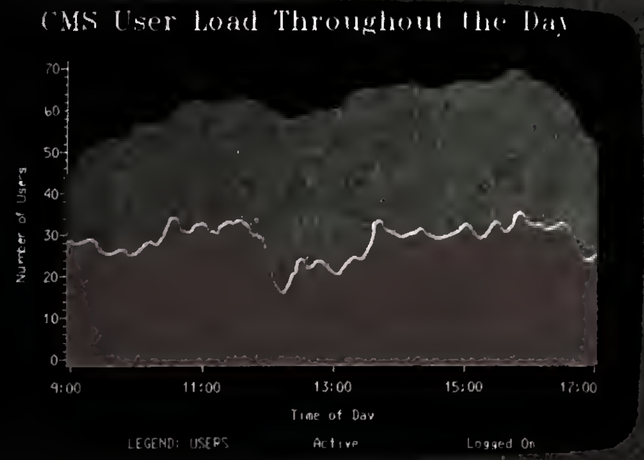
Pie Chart of Revenue



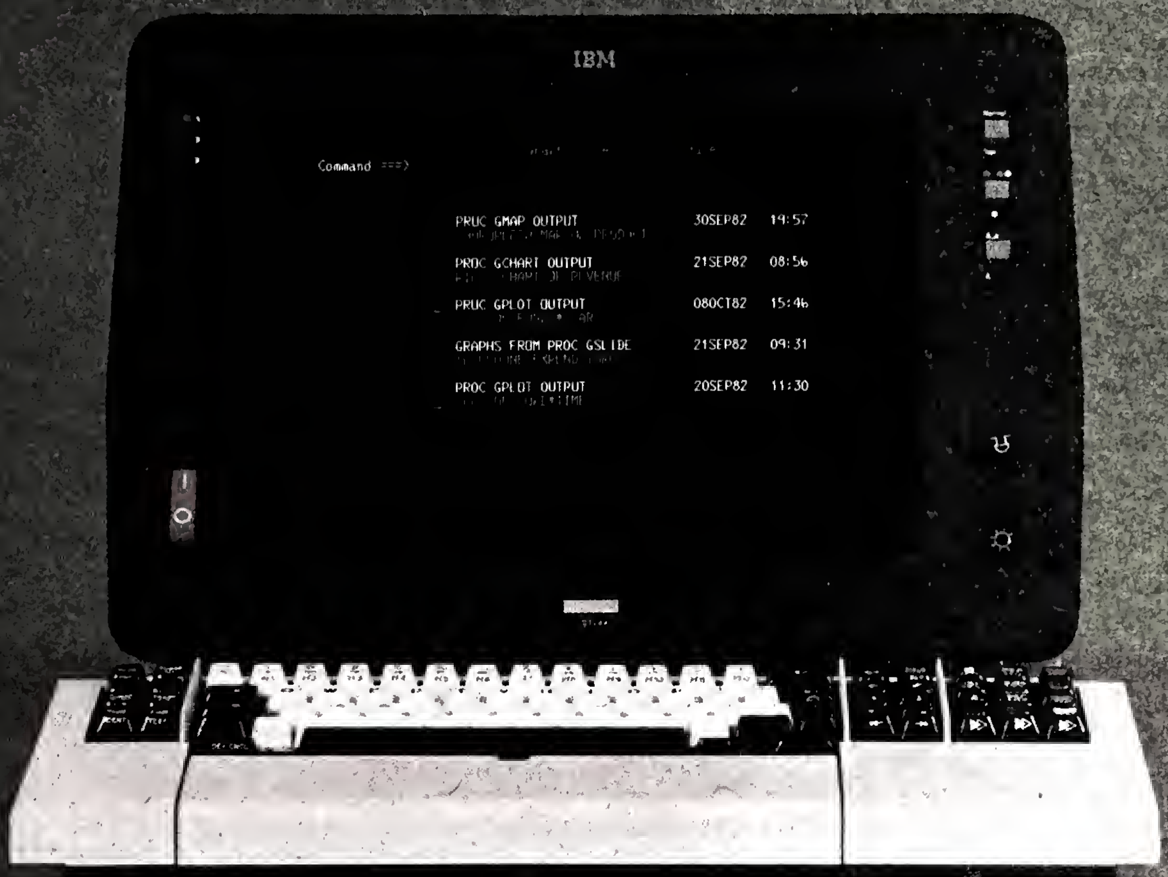
Plot of Funds*Year


TELEPHONE EXPENDITURES FOR TELEMARKETING
(In Millions)
1980
1970
Residential originated local calls
Residential originated toll calls
Business originated local calls
Business originated toll, WATS, 800 calls
TOTAL

Telephone Expenditures



Plot of Load*Time



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Command ===>

PROC GMAP OUTPUT                 30SEP82   19:57

PROC GCHART OUTPUT               21SEP82   08:56

PROC GPLOT OUTPUT                08OCT82   15:46

GRAPHS FROM PROC GSLIDE          21SEP82   09:31

PROC GPLOT OUTPUT                20SEP82   11:30
```

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Micro Notes

Visicorp has announced **Visicalc Advanced Version**, a second-generation electronic spreadsheet program for the IBM Personal Computer and Digital Equipment Corp. Professional Series microcomputers. This product reportedly allows managers to create sophisticated preformatted spreadsheet models. It is priced at $400, the vendor said from 2895 Zanker Road, San Jose, Calif. 95134.

Chase Econometrics/Interactive Data Corp. (CE/IDC) has announced two software offerings designed to ally mainframe power with personal computers. These products, which operate on microcomputers from IBM and Apple Computer, Inc., are called **Financial Xchange** and **Microforma Xchange**. The former reportedly allows research analysts and portfolio managers using spreadsheets to access CE/IDC's Analystics securities data base; the latter is a service that provides access to balance sheet and income statement information from over 7,000 publicly traded companies. They are priced from $450. The vendor is located at 486 Totten Pond Road, Waltham, Mass. 02154.

Software Innovations Visual Calculator is a table manipulation program that features a visual worksheet of up to 1,000 rows and 32,000 columns. It is compatible with Bell Laboratories' Unix III operating system. It costs $149 from Software Innovations, Inc., 440 Amherst St., Nashua, N.H. 03063.

Intel Corp. has upgraded its Intellec Series-II microcomputer development system with the introduction of **Series-IIE**. The product reportedly incorporates new features that enable the user to make commands with fewer keystrokes. The system costs $12,500, the vendor said from 3065 Bowers Ave., Santa Clara, Calif. 95051.

The C **Software Development System** is a compiler for the C programming language for Digital Research, Inc.'s CP/M-based microcomputers. It was developed by Elfin System to emit assembly language code for the host microprocessor or other target microprocessors. This system costs $350. Elfin Systems is located at 265 Nogel Drive, Santa Barbara, Calif. 93110.

Venturcom, Inc. has introduced a series of packages for a variety of microcomputers. A version of Bell Laboratories' Unix operating system intended for the IBM Personal Computer is called **Project Viking**. This product is an integrated software package consisting of Venturcom's Venix operating system, an interactive word processing module, the Logix relational data base manager and a graphics package. This product costs $900. **TEQ** is Venturcom's software package for solving technical equations. It is priced at $295. **Sigpak**, a signal processing package, runs under Venix and Unix. It sells for $5,000. **Venix/2** is a version of the company's operating system for use on the Digital Equipment Corp. LSI-11/2 microcomputer. This costs $1,500. Further details are available from Venturcom at 139 Main St., Cambridge, Mass. 02142.

Digital Marketing Corp. has announced **Plan80**, a spreadsheet financial planning system for Zilog, Inc. Z80- or Intel Corp. 8080- or 8086-based microcomputers running on Digital Research, Inc's. CP/M or CP/M-86. It calculates averages, depreciation, internal rate of return and trigonometric functions and includes a what-if capability. Plan80 costs $295 from the vendor at 2670 Cherry Lane, Walnut Creek, Calif. 94596.

Hewlett-Packard Co. has announced a version of the Forth programming language for its HP Series 200 computers. **Series 200 Multi-Forth** runs interactively on the Model 26 and 36 versions and provides an editor, interpreter, compiler, assembler and I/O handlers with 8K to 12K bytes of random-access memory . The basic package costs $1,500 from 1820 Embarcadero Road, Palo Alto, Calif. 94303.

High Technology Software Products, Inc. has announced enhancements to its **Pace** general-purpose estimating package. The Apple Computer, Inc. Apple II version of Pace has been made compatible with Corvus Systems, Inc.'s hard disk, increasing component make-up storage and retrieval capability to up to 2,000 items. Information on individual components that make up the estimate item is also stored and retrieved, a spokesman said. Pace costs $395 and is available through P.O. Box 14665, Oklahoma City, Okla. 73113.

A simulation program for the Apple Computer, Inc. Apple II, IBM Personal Computer and microcomputers using Digital Research, Inc.'s CP/M operating system has been announced by Applied I. **Twente University of Technology Simulator (Tutsim)** is an engineering design tool that models continuous systems and displays the results numerically or graphically. Apple Tutsim costs $375, CP/M Tutsim costs $400 and IBM PC Tutsim costs $475 from Applied I at Suite 205, 200 California Ave., Palo Alto, Calif. 94306.

Micro Notes

The Computer Co. has announced the availability of its **APL.68000** interpreter on three 16-bit microcomputers, including Instrumentation Laboratory, Inc.'s Pixel 100AP, Corvus System, Inc.'s Concept and Forward Technology, Inc.'s Gateway Work Station. APL.68000 is an implementation of IBM's APL.SV with enhancements. The suggested retail price of the interpreter is $2,000 from the vendor at 1905 Westmoreland St., Richmond, Va. 23230.

Cybersystems, Inc. has announced an extended Forth dialect for Zilog, Inc. Z80- and Intel Corp. 8085-based systems running under Digital Research, Inc.'s CP/M operating system. The **Cyberforth** program development package includes built-in industrial hardware I/O drivers for Cybersystems analog and digital I/O and communications modules and a real-time multitasking executive. The package costs $300 from 7540 S. Memorial Pkwy., Huntsville, Ala. 35802.

Blue Water Systems, Inc. has announced **Expansion**, a word processing package for IBM Personal Computers with Epson Corp. printers. Designed for use with Micropro Corp.'s Wordstar word processing package, it costs $39 through P.O. Box 1877, Oceanside, Calif. 92054.

Mark of the Unicorn, Inc. has announced **PC/Intercom**, which reportedly provides interactive communications functions for IBM Personal Computers. The package features high-speed emulation to Digital Equipment Corp. VT100 CRT terminals. The package costs $99. Mark of the Unicorn can be reached through P.O. Box 423, Arlington, Mass. 02174.

Softcorp International, Inc. has announced **Speedstat Volume 1**, a statistical analysis package for Apple Computer, Inc.'s Apple II or Apple I Plus processor with 48K bytes of main memory. The package costs $250, Softcorp said from 229 Huberville Village Blvd., Westerville, Ohio, 43081.

Selnar Corp. has announced **SGplot**, a graphics package for users of Digital Research, Inc.'s CP/M and MP/M operating systems. The package costs $450, the vendor said from 437A Aldo Ave., Santa Clara, Calif. 95050.

Digital Equipment Corp. has announced 13 software packages developed by various vendors that can be used on DEC's Professional 300 series of personal computers. Packages include a variety of applications aimed at helping small businesses, office managers, engineers, students and system designers, DEC said. The packages cost between $250 and $1,000. Further information is available from DEC at Maynard, Mass. 01754.

Graphic Communications, Inc. has announced a version of its **Graphwriter** business software package for the IBM Personal Computer. The package is available in two format sets — a Basic set and an Extension set. Each costs $395, and both sets are available for $750. The vendor is located at 200 Fifth Ave., Waltham, Mass. 02254.

Smart Systems, Inc. has announced **Smartscreen**, a screen development aid for users of Apple Computer, Inc. processors with a Pascal compiler. The package costs $75, the vendor said from 499 Sulkey Lane, Frederick, Md. 21701.

Acquis Data, Inc. has introduced a communications program for the Altos Computer Systems, Inc. 8000 series microcomputer running under Digital Research, Inc. CP/M 2.2 or MP/M II. **Intercomm** was designed to transfer both text and binary files to or from the Altos and another CP/M-based computers. Intercomm costs $175 from 17192 Gillette, Irvine, Calif. 92714.

Persoft, Inc. has announced two terminal emulators for the IBM Personal Computer. **TE100 Version 1.1** is a full-featured emulator of Digital Equipment Corp. VT100, VT101, VT102 and VT52 terminals. **TE100-FT** is an extension of TE100 1.1 said to add bidirectional file transfer capabilities. TE100 1.1 costs $125 plus $3 for shipping and handling. TE100-FT costs $150 plus $3 from the firm at 2186 U.S. Highway 51, Stoughton, Wis. 53589.

A three-dimensional spreadsheet program for the Commodore Business Machines, Inc. CBM 8032/8096 and the Commodore 64 is available from

(Continued on Page 46)

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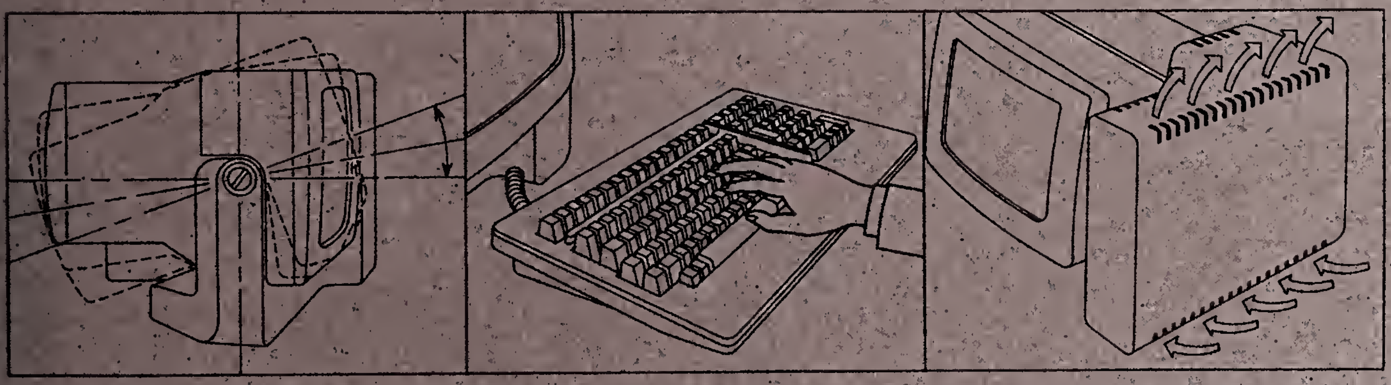

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(Continued from Page 45)

Micro Notes

Computer Marketing Services, Inc. Calc **Result** is currently available for the 8032/8096 at $199 and will be available in February for the Commodore 64 using a disk drive at $150. By March, it will be available for the 64 using a cassette drive at $70. The firm is located at 300 W. Marlton Pike, Cherry Hill, N.J. 08002.

Radio Shack has announced software designed to allow the creation of a personalized electronic filing system using the TRS-80 Model III. **Profile III Plus** reportedly allows storage of up to 2,000 one-segment, 100-char. records. The disk software costs $199. Also from Radio Shack is a disk word processing program for TRS-80 Model I/III microcomputers. **Superscripsit** costs $199 at Radio Shack Computer Centers and participating Radio Shack stores and dealers. The vendor is headquartered at 1800 One Tandy Center, Fort Worth, Texas 76102.

A spreadsheet system called **Finanser+**, written in Ryan-McFarland Corp. RM/Cobol, is available from Datamate Co. It will run in 16-bit mode on the Radio Shack Corp. TRS-80 Model 16's Motorola Corp. MC68000. It costs $395, a vendor spokesman said from Suite 101, 4135 S. 100th E. Ave., Tulsa, Okla. 74145.

Graphics Processing System software for Apple Computer, Inc. Apple II+ computers was unveiled by Stoneware, Inc. The software is priced at $179, according to the vendor at 897 Independence Ave., Mountain View, Calif. 94043.

Sort/PC, a disk sort/merge utility specially optimized to run on the IBM Personal Computer, was recently released by Icon, Ltd. Sort/PC can be used on any IBM Personal Computer configuration with a minimum of 64K bytes of random-access memory and two floppy disk drives. Sort/PC is available for $67. Icon can be reached through P.O. Box 57380, Washington, D.C. 20037.

A Digital Research, Inc. CP/M-compatible implementation of the Databus programming language is available from Sunbelt Computer Systems, Inc. **SunDB80** implements Isam through a full B-tree indexed file system that includes features such as reusing of deleted record space, read key sequentially forwards and backwards, multiple indices and self-balancing indices that eliminate the need for reorganization of the index file. SunDB80 is available for $995 from the vendor at Sunbelt Center, 2455 E. 51st St., Tulsa, Okla. 74105.

A **communications package** for the Apple Computer, Inc. Apple II using the Hayes Microcomputer Products, Inc. Micromodem has been introduced by Micro-Ed. The package includes uploading, downloading and dial-up programs as well as text preparation programs in uppercase or lowercase. The package is priced at $150 from the vendor at 31 Marshall Drive, Edison, N.J. 08817.

A **full-screen editor** for programming on the IBM Personal Computer is available from Personal Systems Technology, Inc. Priced under $100, the screen editor is available from the vendor at 22957 La Cadena, Laguna Hills, Calif. 92653.

Microcomputer training products, designed to teach first-time computer users and their staff how to use microcomputer software, are available from Merchants House, Ltd. Interactive and audio formats train newcomers how to learn the features of Digital Research, Inc.'s CP/M operating system, IBM's PC-DOS operating system, Visicorp's Visicalc and other products. Priced below $100, the programs are available from Merchants House, Suite 204, 1181 Chess Drive, Foster City, Calif. 94404.

The **Wordstar Memory Jogger**, a reference manual from JC Computer Specialists, was designed to help the nonprofessional programmer remember the format of statements, functions or commands. It is available for $10 from JC Computer Specialists through P.O. Box 3465, Federal Way, Wash. 98003.

A program to sort the rows of columns of a Visicorp Visicalc spreadsheet, called **Visibridge/Sort**, has been introduced by Solutions, Inc. Available for the Apple Computer, Inc.'s, Apple II+ and III, the IBM Personal Computer and Radio Shack's TRS-80 Models I, II/16 and III, it is priced at $89. It is available from the vendor through Box 989, Montpelier, Vt. 05602.

A software program is available from Strobe, Inc. **Strobe-hires** plots high-resolution graphics directly from the Apple Computer, Inc. Apple II and Apple III screens. The plotter costs $785, the interfaces are between $85 and $195 and the software costs between $50 and $145. Further information is available from the vendor at 897-5A Independence Ave., Mountain View, Calif. 94043.

A **full-screen editor/assembler program** for the Radio Shack TRS-80 Model III is available from Structured Software Services. It features numerical expressions, character constants and a global search. It is priced at $37.50 from the vendor at 9233 N.E. 269th St., Battle Ground, Wash. 98604.

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Step After Dedicated Minis

Users Demanding Local Net Advantages

By Jeffrey S. Wilson
Special to CW‡

Local-area networks connecting personal computers are no longer subject to speculation. As the costs of computing power, communications hardware and mass storage have declined, a growing number of professional computer users have demanded the advantages that local-area network-based systems provide.

Many who have installed and operated this new equipment regard it as the logical step forward from dedicated minicomputers and conventional time-sharing, since it seems to offer only the better features of both of them.

But some users are discovering that certain kinds of applications are difficult to build using the local-area network-based systems they have just installed. They can use conventional file access methods or data base management techniques to manipulate stored data right there within their personal nodes (workstations on the local-area network), but remote access is difficult.

To share data, they must generally either copy large files wholesale, back and forth across the network or designate a node as a data base server and submit access requests to it.

Copying is unattractive because it can tie up a large fraction of some local-area network's capacities, involve long delays, waste disk space and introduce the chance for inconsistency among multiple copies of the same data. The data base server approach avoids these problems by centralizing the data, but it subjects the users to time-sharing's major drawback: As the user community grows, performance plummets since everyone gets in line to use the shared resource.

A truly distributed, local-area network-based data base management system (DBMS) would allow users to access data stored anywhere on the local-area network transparently, as though it were stored locally. This means users would not have to modify their programs if available data were moved to disks located anywhere else on the local-area network. And, as a practical matter, remote data access would have to deliver performance comparable to that of local-data access.

A large data base might include several 100M bytes of on-line storage distributed among scores of disks. For this reason, the local-area network-based DBMS would offer users the same data base access method choices as found on production-oriented, mainframe-based DBMS products.

(Continued on Page 48)

Features Enhanced Voice

Baby Bell Offers Smart Phones

LAS VEGAS — American Bell, Inc. introduced has introduced two smart telephones that can be reconfigured for specific applications.

The Genesis telesystem features add-in cartridges and add-on modules that enable the user to customize and reconfigure the Genesis terminal for each application. Information is displayed on a 20-char., 5 by 7 dot matrix alphanumeric screen.

Initially, three cartridges are being offered which provide enhanced voice capabilities — such as call waiting, call forwarding and continuous redial of busy numbers. An "electronic datebook" cartridge is also planned. The first module will provide random access to a personal phone directory.

Genesis telesystems will be marketed through Bell Phone Centers, beginning midyear, and through Sears Roebuck and Co. as well as other retail stores. The basic unit will carry a suggested retail price of $350, cartridges will cost $29.95 to $49.94 apiece and the module about $250.

The other new American Bell terminal is called the Touch-A-Matic 1600. It does not accept cartridges or modules, has a smaller screen and more limited keyboard than Genesis. Suggested retail price of the Touch-A-Matic 1600 is $149.95.

Touch-Tone Out for System/34

BURR RIDGE, Ill. — Touch-Tone Entry with Voice or Tone Response is now available to IBM System/34 and System/38 users from Access Telecom.

A customer calling from a Touch-Tone telephone is answered automatically by the "voice" of Access (customized by the user). The caller enters his identification and password via the Touch-Tone telephone key pad and reportedly is verified by the System/34 or System/38. The data is then guided through the data entry or inquiry process by voice (or tone) prompting and response. The data is input directly to the host system for on-line manipulation by the user's RPG programs. Data can be received from eight or more telephone lines simultaneously.

Prices range from $14,995 to $25,995 for up to eight voice ports. More information is available from Access Telecom, which is located at 60 Shore Drive, Burr Ridge, Ill. 60521.

Z-Disk Desktop Gets Four Packages

REDWOOD CITY, Calif. — Product Associates, Inc. has introduced four software packages for its Z-Disk Desktop multiuser microcomputer system. The packages are said to be compatible with Digital Research, Inc.'s CP/M operating system.

Z-Disk/Hasp is designed to provide communication with any remote CPU that provides support for a Hasp Multileaving Workstation. It is available for $1,495.

The Z-Disk/3780 is an IBM 2780/3780 software emulator package for communication over point-to-point telephone lines with any CPU or device that provides support for specific IBM terminals and CPUs. It is available for $550.

The Z-Disk/3270 is an IBM 3270 terminal software emulator for communication over point-to-point telephone lines with any IBM 360, 370 or 30 series CPU. It is available for $550.

The Z-Disk/Async is an asynchronous communications software package for communication with a mainframe or another microcomputer, available for $195.

More information is available from Product Associates, 465 Convention Way, Redwood City, Calif. 94063.

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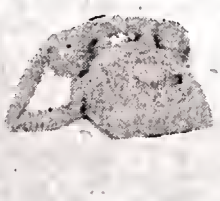

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HSLD/1 Drives Local Circuits

SUNNYVALE, Calif.— Prentice Corp. announced the availability of a high-speed, synchronous line driver for use on metallic, twisted-pair, Local-Area Data Service circuits.

The HSLD/1, is designed for high-speed, high-density data transmission in either full- or half-duplex modes at switch-selectable rates of 2,400 bit/sec to 19.2K bit/sec. Features include slot transparency, which permits the removal and replacement of the unit without disconnecting interface cables and At-A-Glance diagnostics.

Rack-mountable configurations are priced at $420, stand-alone units are $490 from the vendor at 266 Caspian Drive, Sunnyvale, Calif. 94086.

Offers 17-In. Monochrome Screen

Quadram Unveils Monitor for IBM Micro

NORCROSS, Ga. — A high-resolution, 17-in. screen monitor designed for the IBM Personal Computer has been introduced by Quadram Corp.

The monochrome screen reportedly displays 10,240 characters, said to be five times the screen capacity of the Personal Computer monitor.

Quadscreen reportedly has full IBM PC DOS/Basic I/O Subsystem (BIOS) compatibility, plus added commands for character set determination.

Features include an infinite user-definable character set; standard P4 phosphor screen, or optional P39 green phosphor; dot addressability; super spreadsheet; split-screen functions; driver firmware in read-only memory and a display controller card with 64K bytes of memory.

Priced at $1,950, Quadscreen includes monitor, display controller board, cable and software that reportedly can configure characters of any size or shape. Quadram is located at 4357 Park Drive, Norcross, Ga. 30093.

Users Seek Local-Area Net Benefits

(Continued from Page 47)

Since local-area networks grow in a bottom-up fashion as more and more users connect their own processors, it is awkward to impose traditional top-down data modeling upon them. The traditional approach requires all users to agree upon a single plan (or schema in Codasyl terminology) for the organization of a centralized, shared data base before anyone can use it.

A full-time professional employee called a data base administrator (DBA) is often retained to manage the inevitable negotiation process.

The local-area network-based DBMS would let professional users work the way they want to work. They would be able to design and use their own data bases in processing-power-intensive local applications such as computer-aided architectural design without help from a DBA. Later, they would be able to combine their individual data bases into a shared design data resource. Finally, they might work with a DBA to combine the design data with materials requirement planning data.

At that point, the users would create a valuable bridge of information between research and development and manufacturing organizations within their company. They would access either the entire combined data base or any restricted view by applying the same DBMS tools as they would use to create and manipulate local data bases.

Now, data management technology designed for high-performance local-area networks delivers the benefits of truly distributed DBMS. Individually created and maintained data bases are not being combined by physically merging them into a new data base, for that would only reintroduce all of the copying problems.

Instead, the individual data bases are mapped into a combined data base view, or aggregate schema. Under control of the aggregate schema, a copy of the DBMS software located on one node temporarily copies into main memory via the local-area network only those small portions (pages) of the remote individual data bases that are currently in use.

By accounting for and moving only those particular pages on a demand basis, network traffic is minimized, disk space is conserved and the management of data consistency is greatly simplified.

Wilson is product marketing manager at Apollo Computer, Inc., 19 Alpha Road, Chelmsford, Mass. 01824.

ONCE YOU
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How do you overcome the "not invented here" syndrome? Who selects applications software packages? What criteria do they use? This February 28th Computerworld Special Report on Applications Software will take you from selection to implementation with special emphasis on the issues that become relevant once you get your packages in house.

This special report is going to give you the kind of information you need to get the packages you select up and running. You'll get case histories and applications stories that describe the experiences of users of specific packages. You'll also get tutorial, and non-product-specific articles that will examine different issues and concepts around purchasing and implementing software application packages. Here's the questions you'll get answers to in February's special report:

- **How are canned solutions better than home-grown software?**
- **Is "end-user friendliness" a reality in applications packages?**
- **Conversion: When is it possible? How is it achieved?**
- **How much customization is necessary when installing a package?**
- **How long does it take to get an application package up and running, compared to in-house systems? What is the procedure?**

If you use, buy or need applications software packages, you won't want to miss this special report. Turn to Computerworld next February 28th — and get your packages off and running.

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Sealed Terminal Announced

ETTERS, Pa. — HMW Enterprises, Inc. has introduced a color graphics terminal said to be dustproof, oilproof and watertight.

The HMW 9203 Rainbow is a sealed terminal for use in industrial environments. The front panel is a touch-sensitive membrane keyboard with a clear viewport. Thirteen function keys are located around the viewport with the alphanumeric keys clustered in one area.

Displays may take the form of alphanumerics, character graphics, point, vector and bar-plot graphics in eight colors, the vendor said.

The terminal costs $5,500 from HMW Enterprises, 604 Salem Road, Etters, Pa. 17319.

With Impact-Protective Screen

Terminals Target Hostile Environments

FAIRFIELD, Conn. — A complete line of CRT terminals specifically designed for use in hostile industrial environments was announced by PDS Technologies, Inc.

The PDSTech terminals are designed to operate under adverse conditions of temperature, environment and input power. The terminals are completely sealed within an all-metal housing and have an impact-protective screen. Tactile function keys are also integral to the units, according to the vendor.

The terminals reportedly will operate under severe distortion, transient and surge conditions. Shock and vibration resistance are also incorporated within the unit.

The units are priced at approximately $2,900, depending upon keyboard configuration, interface protocol and memory, through PDS, 2000 Black Rock Tnpk., Fairfield, Conn. 06430.

Four RS-232C Channels Featured On Intelligent Interface Board

DAVENPORT, Iowa — Archives, Inc. has introduced an intelligent serial interface board with four individually programmable, bidirectional, serial EIA/RS-232C communication channels.

The board includes a user-programmable Zilog, Inc. Z80A microprocessor operating at 4 MHz, 64K bytes of random-access memory and up to 8K bytes of erasable programmable read-only memory. Via a built-in configuration program, the user can specify for each of the four channels the transmission rate (50 to 19.2K bit/sec), parity and amount of memory for both input and output, the vendor said.

The channels can also be programmed so the board will interface the host with up to four unintelligent terminals. Three of the board's four channels support asynchronous protocols, the fourth supports either asynchronous or synchronous protocols.

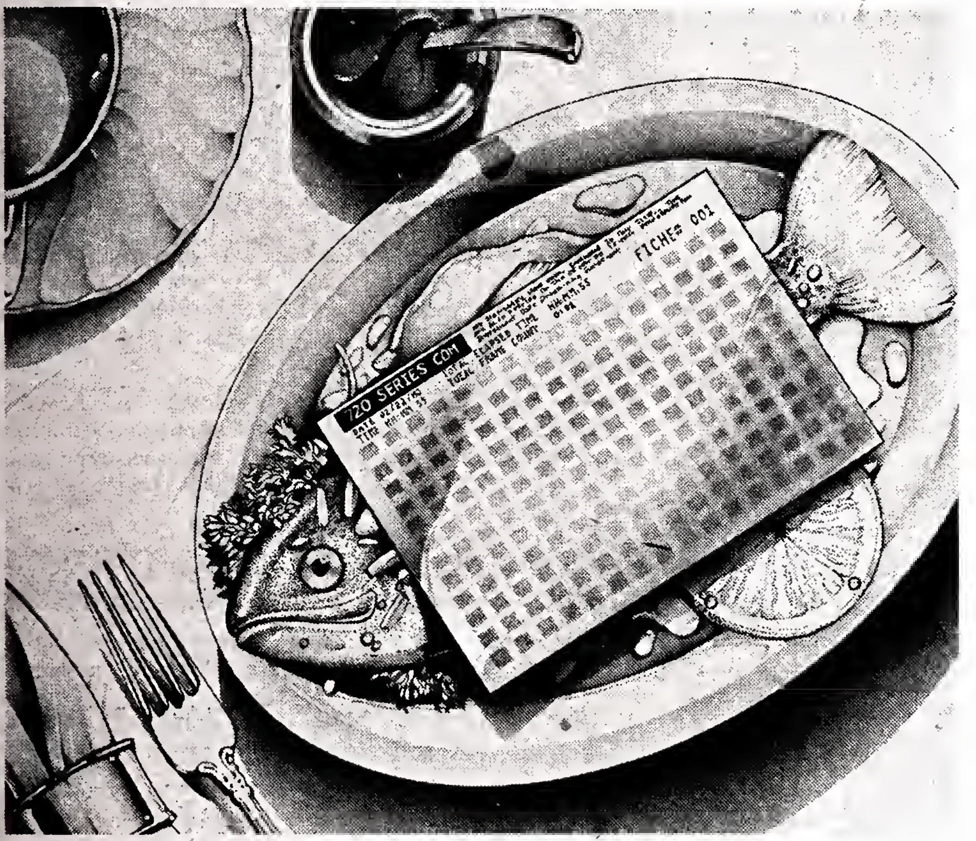
The board costs $695, Archives said from 404 W. 35th St., Davenport, Iowa 52806.

Price Cuts Announced For Concept AVT Line

PHILADELPHIA — Human Designed Systems, Inc. has announced price reductions for its family of Ansi/Digital Equipment Corp.-compatible Concept AVT terminals.

The Concept AVT with four pages of memory has been reduced to $1,295 from $1,575; with eight pages of memory, the unit is reduced to $1,445 from $1,855. Concept AVT-APL terminals have been reduced to $1,495 and $1,645, from $1,750 and $2,030 respectively, according to the vendor.

More information on the reductions is available from Human Designed Systems, which can be reached at 3440 Market St., Philadelphia, Pa. 19104.



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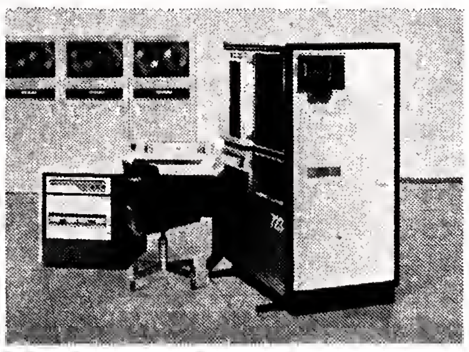

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IRC Division Unveils Controller

EL SEGUNDO, Calif. — The Crydom Division of International Rectifier Corp. (IRC) has introduced a controller said to facilitate the use of its single-cable remote I/O system by providing most of the communications programming.

The Model 8105 controller reportedly accepts standard RS-232C asynchronous input from master consoles and generates a standard RS-422 output to remote interface adaptors at individual workstations.

The controller costs $999 from IRC, which is located at 1521 Grand Ave., El Segundo, Calif. 90245.

PABX Gets Remote Aid

GARDEN GROVE, Calif. — Anaconda-Ericsson Communications announced its remote maintenance capability for the Prodigy digital private automatic branch exchange (PABX).

The built-in, dial-up system identifies faults by a series of 10 diagnostic steps that check lines, trunks, common control equipment, system configuration and minor alarm status.

Other system features enable changing directory numbers and class of service by dialing through a standard Touch-Tone telephone, a vendor spokesman said.

Included in the price of the PABX, which is approximately $600 per month, the remote maintenance capability is available from the vendor located at 7465 Lampson Ave., Garden Grove, Calif. 92641.

USI Announces Color Monitor

BRISBANE, Calif. — USI International announced the addition of a 14-in. composite video color monitor to its line of amber and green monitors.

According to the vendor, the 14-in. screen was selected for the new monitor because of the use of the monitors in so many graphics applications.

USI's color monitor eliminates the two-step process of converting the computer's video signal to a form that a television can receive and the subsequent conversion within the television back to a pure video signal.

The new color monitor is priced at $399 from the vendor at 71 Park Lane, Brisbane, Calif. 94005.

Direct Connect Modem, Smart Modems Offered

TARZANA, Calif. — Novation, Inc. has introduced a 300 bit/sec direct connect, autoanswer/originate modem and two smart modems.

The 5-in. by 1.9-in. by 1.3-in. J-Cat plugs into the RJ11C phone jack and can detect a carrier or get a dial tone. Other features of the direct connect modem include a disconnect/test key, connect/break key, self-test and compatibility with RS-232C, a vendor spokesman said.

The 103 Smart-Cat modem is a 300 bit/sec full-duplex modem; the 103/212 Smart-Cat is a 1,200 bit/sec full-duplex modem. Both feature a built-in dialer, autoanswer, direct connect, analog and digital loopback testing and a software command set.

The J-Cat is available for $149, the 103 for $249 and the 103/212 for $595, the vendor said.

More information is available from Novation, which is located at 18664 Oxnard St., Tarzana, Calif. 91356.

TRW-Fujitsu Introduces Internal Modem for 7880

LOS ANGELES — TRW-Fujitsu Co. (TFC) has introduced an internal modem for use with its TFC 7880 Point-Of-Sale Terminal or the 7110 Terminal Support Processor.

The modem transmits at 2,400 bit/sec and can be plugged directly into any standard telephone microjack for use with a switched network system. In addition to answering standard ring signals, the modem can optionally place outgoing calls, a vendor spokesman said. The modem is fully Federal Communications Commission-certified and approved.

The TFC 2,400 bit/sec modem is available for $900 from TFC, Suite 620, 9841 Airport Blvd., Los Angeles, Calif. 90045.

Upload-Download Tool Out

LINCOLN, R.I. — International Data Sciences has introduced a communications software package for uploading and downloading test routines between a host site and field locations.

The Upload-Download ROM-PAC (4030-RP-11) was designed for the IDS Hawk Model 4030 Programmable Datacomm Tester, a field service communications test instrument that features 51 resident features.

The package contains a print routine for printing the complete contents of the Model 4030 program steps and messages, according to a vendor spokesman.

It is available for $275 and the tester costs $3,995 from International Data Sciences, 7 Wellington Road, Lincoln, R.I. 02865.

TI Asynchronous Interface Links Units to Series 600, 800

AUSTIN, Texas — A low-cost asynchronous interface for attaching printers, terminals or modems to its Business System Series 600 or 800 computers has been announced by Texas Instruments, Inc.

The Communications Interface 402 (CI402) provides an interface to two 9,600 bit/sec asynchronous devices compatible with RS-232C or V.24 protocols. The CI402 replaces a single-channel teletype/Electronic Industries Association card.

Compatible interfaces include the Series 300 two-channel interface, the Series 300 processor port and the Series 600 processor port. The interface definition is common to all these interfaces.

The communications interface occupies a half slot in the Business System Series 13-slot chassis. The CI402 is available for $495 from the vendor at P.O. Box 202146, Att: H-641, Dallas, Texas, 75220.

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Specific requirements for this year's examination are detailed in the "Certificate in Data Processing Examination Announcement and Study Guide." The study guide and application form for the 1983 examination are available on request from ICCP.

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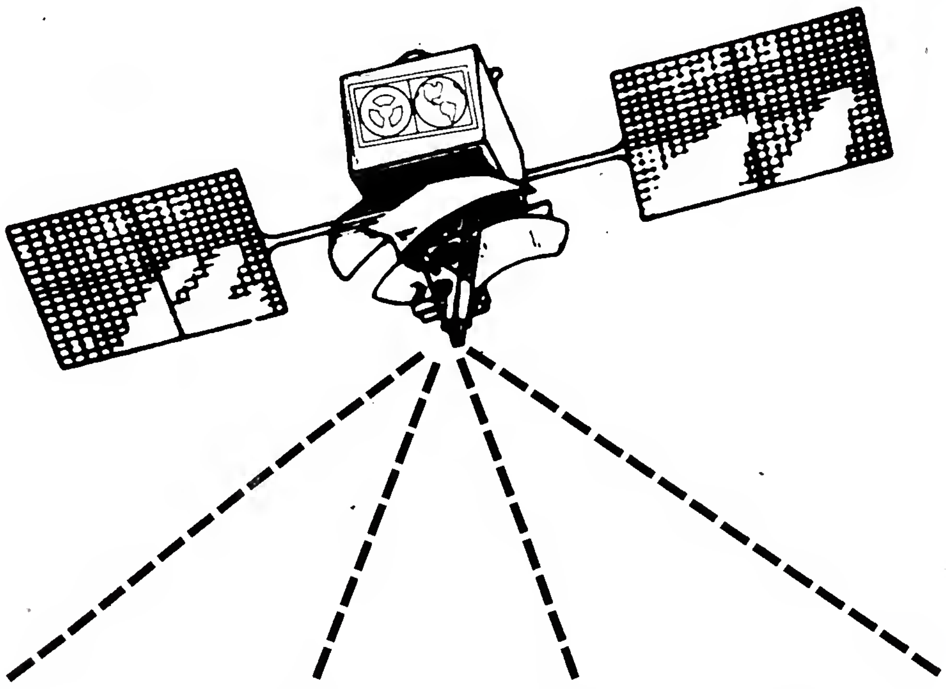
In the two issues for 1983, *Computerworld On Communications* will apply the proven editorial resources of *Computerworld* to the area of communications networks. It will look at the implications of enhanced communications within the business organization together with the impact on established systems operations.



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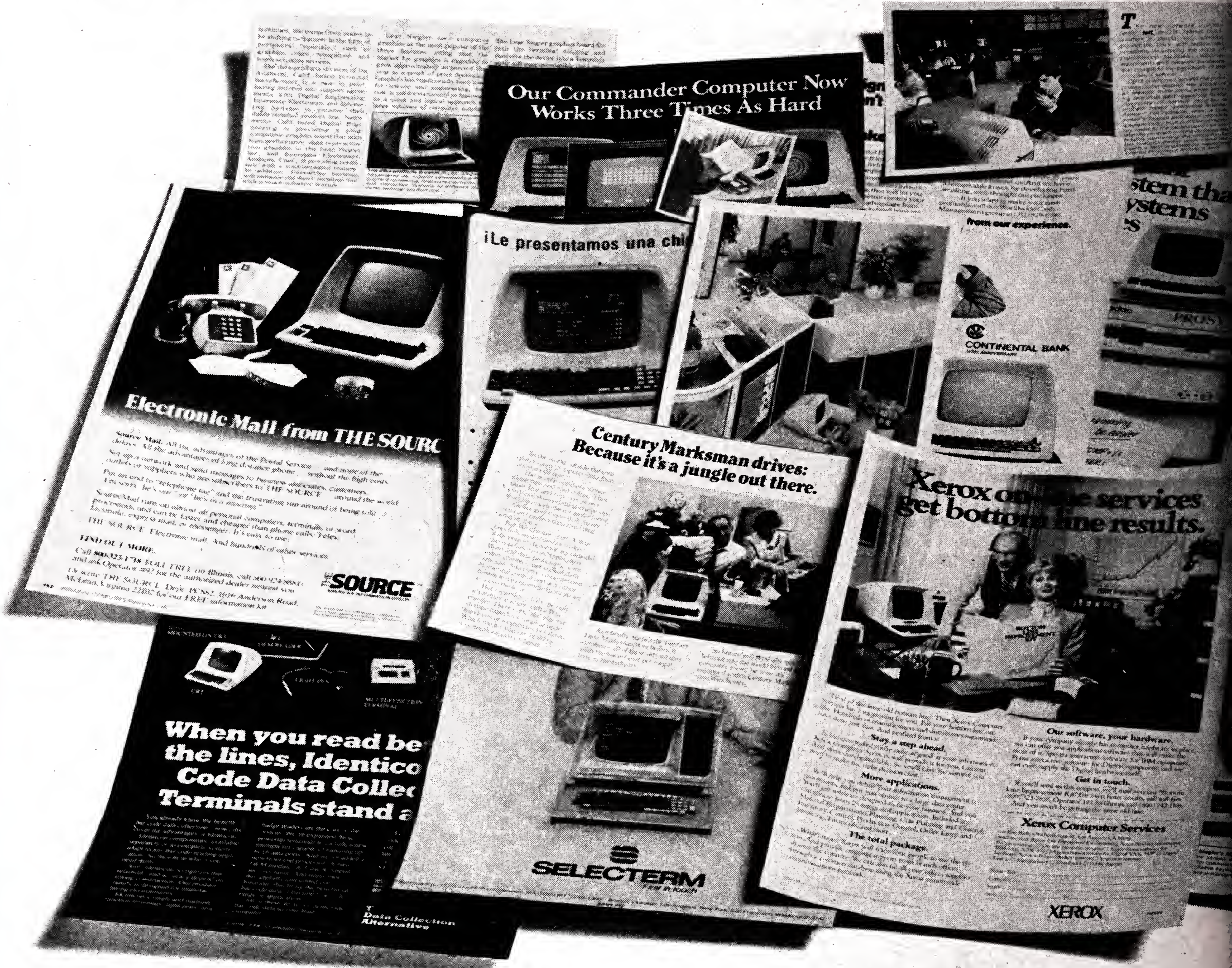
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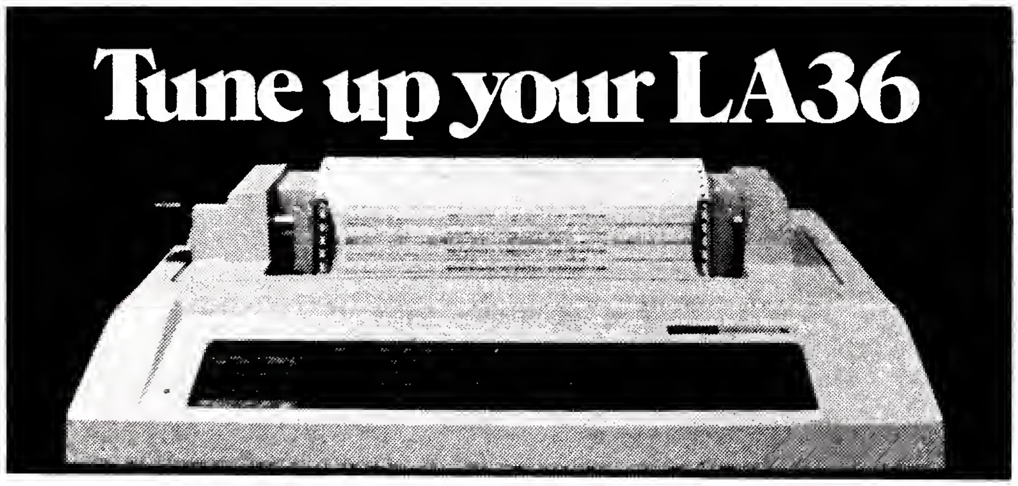

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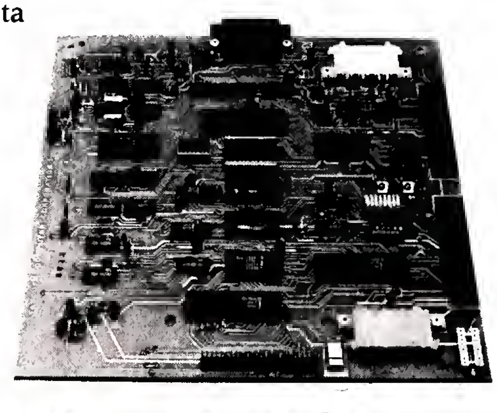

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Identification Terminal Out for Banks With ATMs

SAN JOSE, Calif. — Atalla Corp. has introduced a terminal that reportedly provides financial institutions with customer identification at teller stations using any plastic card at its automated teller machine. The terminal is said to work with any customer code system already in use.

The microprocessor-based All Systems Identification Terminal has a 12-key telephone-type customer key pad, an eight-digit alphanumeric display and three control keys on the teller side. It also features a magnetic stripe card reader that can be used from either side.

The terminal is said to eliminate delays in signature comparison, interbranch telephone calls and other manual customer identification methods.

It is available for $995 from Atalla, 2363 Bering Drive, San Jose, Calif. 95131.

T-Bar Unveils Micro-Based Series Of Fixed-Protocol Data Monitors

WILTON, Conn. — T-Bar, Inc. has unveiled a series of fixed-protocol data monitors for use with synchronous digital data.

The Explorer DM-1 Data Monitor offers autospeed to 19.2K bit/sec full duplex, paging buffer, CRT display with hexidecimal/normal read-out, LED activity indicators and real-time message and error counts.

The unit features microprocessor-based architecture that provides a built-in self-test and firmware-driven protocol/code set with automatic transmission rate detection.

Five models feature the following protocols: IBM's binary synchronous communications, Synchronous Data Link Control/Systems Network Architecture, Pars/Ipars and Xerox Corp.'s X.25.

Each costs $1,895 from T-Bar at 141 Danbury Road, P.O. Box T, Wilton, Conn. 06897.

Data Communications Options Out for Beacon Graphics System

LAKE MARY, Fla. — Florida Computer Graphics, Inc. has announced 11 data communications options said to allow the firm's Beacon color graphics computer system to communicate with any host computer, office system or intelligent peripheral, according to the vendor.

The options include emulation of asynchronous and binary synchronous communications, emulation of IBM Systems Network Architecture/Synchronous Data Link Control devices and Digital Equipment Corp. VT-100 terminal emulation as well as a native asynchronous mode.

Option pricing begins at $300 from Florida Computer Graphics, 1000 Sand Pond Road, Lake Mary, Fla. 32746.

Breakout Box for RS-232 Interfaces Announced by Remark Datacom

WOODBURY, N.Y. — Remark Datacom, Inc. has announced the Model 51, a breakout box for RS-232 interfaces.

The unit gives RS-232 users the ability to reconfigure connections or signal paths. The device is often used when interfacing new devices such as printers and CRT terminals.

Model 51 is equipped with male and female 25-pin connectors. This allows users to place the unit in series with any RS-232 cable, the vendor explained.

The Model 51 costs $37.95, the vendor said. Remark Datacom is located at 4 Sycamore Drive, Woodbury, N.Y. 11797.

Kit Allows Apple, Xerox Micros To Emulate Burroughs CRT

BIRMINGHAM, Ala. — Mid-South Data Industries has introduced a software package said to allow an Apple Computer, Inc. Apple II or a Xerox Corp. 820 or 820 II microcomputer to emulate the Burroughs Corp. TD830/MT983 CRT terminal.

Microbridge/B consists of a terminal emulation module and a micro/host file transfer module. The user can tailor the host file transfer module to match his own system environment, the vendor spokesman claimed.

A monitor mode allows the user to see line activity and determine if his address is being polled.

Terminal status can be displayed on the last line of the screen, the vendor said.

The package is available for $995 from Mid-South Data Industries, Suite 104, 237 Oxmoor Circle, Birmingham, Ala. 35209.

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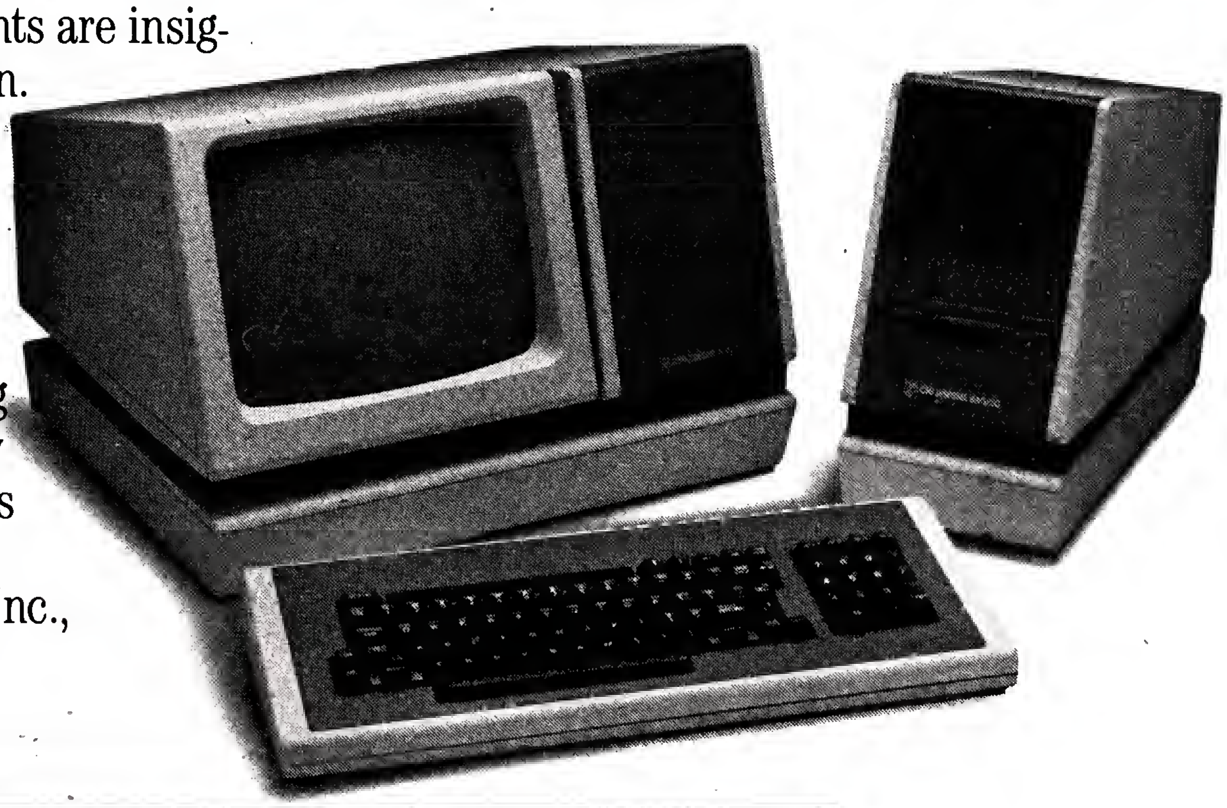

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Hewlett-Packard Unveils Protocol Analyzer Unit

PALO ALTO, Calif. — Hewlett-Packard Co. has announced the HP 4955A, a protocol analyzer that reportedly operates at speeds between 50 bit/sec and 72K bit/sec in a full-duplex mode.

The unit includes 128K bytes of random-access memory for storing data, lead status and timing. By using 63 separate triggers, the unit can simultaneously search for multiple events, the vendor said.

The HP 4955A provides the capability to identify network problems and helps improve network availability, the vendor said.

The protocol analyzer costs $20,950. A Basic language option costs $2,015. Interface pods, which connect the analyzer to a variety of networks, cost $1,110 each.

More information is available from HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Test Bed Cable Out From Sytek

SUNNYVALE, Calif. — Sytek, Inc. has introduced Localnet 50/10, a test bed cable kit that reportedly enables customers of Sytek's Localnet to construct inexpensively a simulated broadband local-area network system.

The kit requires a minimum setup space and does not require tools for the connection of its F-type connectors. It includes one splitter, six directional couplers and one 75-ohm terminator, the vendor said.

The kit costs $100. Sytek is based at 1153 Bordeaux Drive, Sunnyvale, Calif. 94086.

Portable Test Set Monitors Data

LINCOLN, R.I. — International Data Sciences, Inc. has introduced a portable, diagnostic data communications test set designed to monitor and communicate interactively with data appearing at the RS-232 interface.

The microprocessor-based Hawk 4010 Datatrap displays data traffic on a 5-in., 512-char. CRT display. Interactive and monitoring capabilities are accessible through menu pages displaying instrument configuration status to guide the user through fault analysis procedures, the vendor said.

It is said to locate and isolate problems in the hardware and software by simultaneously displaying both transmit and receive data.

The 4010 is available for $4,995 from International Data Sciences, 7 Wellington Road, Lincoln, R.I. 02865.

Switch Product Provides ATM Link

FUQUAY VARINA, N.C. — Software Development and Maintenance, Inc. has introduced a switch product for automated teller machines (ATM) that is said to interface directly with its ATM Transaction Control System and IBM's 3624/3614 On-Line Application and Reporting System.

The TCS-Switch's abilities include: integrating switch transactions with local transactions for reporting and posting; clearing fees with transactions or interchanging fees between banks based on transaction volumes; forcing the settlement date to comply with the switch business date; and backing out the transaction amount when exceptions occur.

The switch is available for $10,000 from Software Development and Maintenance, P.O. Box 668, Fuquay Varina, N.C. 27526.

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SPECIAL REPORT

Data Communications Networks: The Long and Short of It

Edited by Jim Bartimo and Bruce Hoard

January 31, 1983

COMPUTERWORLD
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An Important Factor to Consider

Risk Must Be Assessed in Net Development

By Ralph R. Melone
Special to CW‡

Design methodology for communications networks has been documented by a variety of communications companies and notable experts in the field. However, little has been written dealing with risk assessment and risk-return relationships for communications network development projects.

Risk refers to the following:

- Implementation costs that greatly exceed planned levels.
- Technical performance of completed systems that turn out to be far below estimates.
- Incompatibility of the system with selected communications hardware and software.
- Failure to obtain any/all anticipated benefits of the network.
- Time for implementation that exceeds expectations.

Risk is important for a variety of reasons. Designing networks is a relatively new discipline when compared with systems development as a whole. The risk of disaster needs to be minimized.

Three dimensions of a communications network project have significant impact upon the project's risk — size, technical experience and project structure.

Projects with large staffing levels, dollar expenses, elapsed times and many affected users carry more risk than projects with smaller attributes (Figure 1). The level of risk also varies directly with the size of the project as a percentage of the firm's total portfolio budget.

The number of technical considerations required to design a communications network can be overwhelming. The amount of hardware, software and vendors entering and already in the marketplace is increasing at a furious pace.

The level of familiarity of a project team with hardware, software and communications design issues has a strong impact on the degree of risk a project will have. Project risk will increase as the project team's familiarity with technical considerations decreases (Figure 2).

The structure of the network project will depend on how well the organization has defined project tasks and outputs. If the project is highly structured — that is, tasks and outputs are well defined — risk is minimized. Risk is greater when project tasks and goals are nebulous and constantly changing (Figure 3).

The key is not to avoid risk completely, but to minimize risk while maximizing return. A firm with no high-risk projects may be leaving a product or service gap into which competition can step. On the other hand, the firm loaded with high-risk projects may be vulnerable to operational disruptions when projects are not completed when planned.

Risk for large-size projects can be minimized through a variety of techniques. Prioritization of objectives and goals can reduce a project's scope. Project management techniques can be used to monitor both budget and schedule milestones, minimizing surprises.

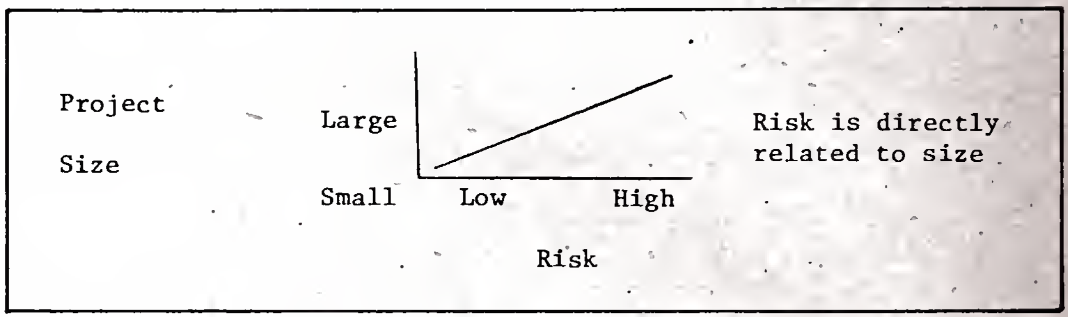

Figure 1

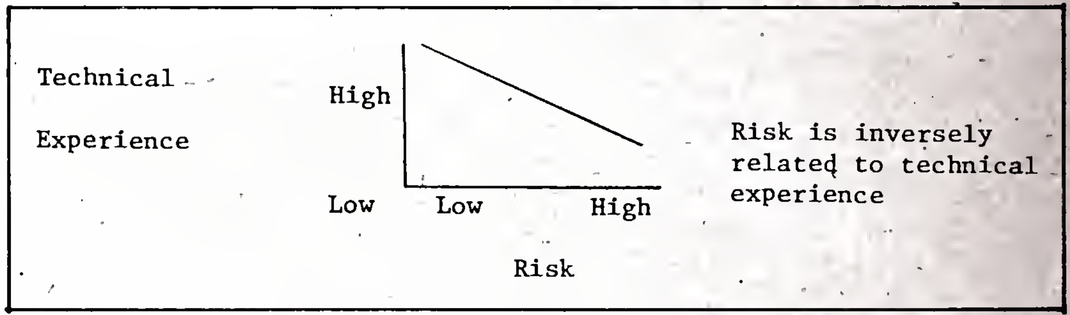

Figure 2

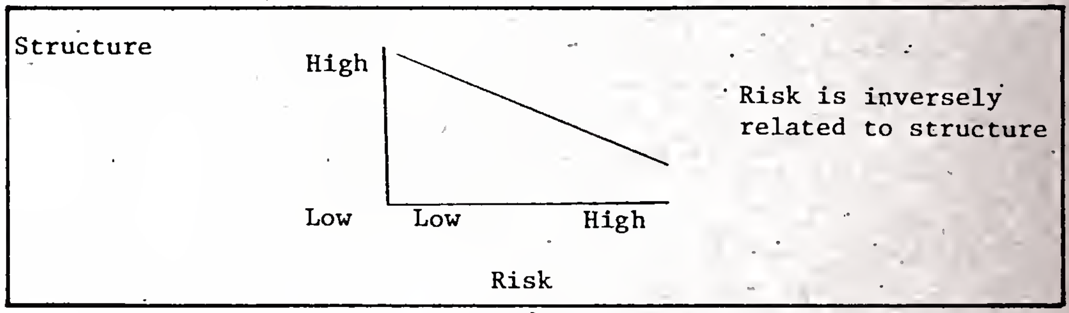

Figure 3

Risk minimization for projects with little technical experience can take the form of pilot projects. A pilot project can provide experience for project members. Design parameters can be tested and vendor service can be evaluated. Network simulation programs are available for assisting in the design of large-scale multipoint communications systems.

Network and design programs are available for determining concentrator and multiplexer allocation, terminal clustering and economic analysis. Large communications vendors will provide these services to companies once a commitment for hardware purchase has been made. Technical consultants can also be hired.

Unstructured projects, once identified, can be better defined by users if project managers point out the dangers of ill-defined tasks and outputs. Communications network pro-

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Integrated Approach Critical to Net Control

By Van Chu
Special to CW‡

In today's rapidly expanding communications industry, the battle for time and predictable network performance is no longer confined to users, technicians, engineers and technical managers: It is being fought by managers, corporate officials and directors. Many data communications manufacturers compete aggressively to offer a wide range of network products, but only a handful truly provide a full measure of defense against the constraints of time and performance.

Although network control, performance and management systems rank among the key weapons in waging this battle, no one system offers a total solution. Achieving this solution requires a delicate mix of network control and performance measurement, blended together to create an efficiently managed network.

The objective is admirable, but is getting there really half the fun? The ever-growing data communications marketplace, with its vast offerings of networking products, places the management information systems (MIS) manager in a mind-boggling predicament. Among the many considerations to ponder lies the question of whether to mix performance measurement with side-channel or main-channel network control.

Each combination offers merit on its own, but an integrated approach often provides the greatest measure of relief. Moreover, the right system will serve a multipurpose role in the corporate scheme: It not only achieves MIS goals, but also minimizes the financial and technical burdens associated with implementing systems.

MIS managers and executives know that a company's profits rely more heavily than ever on greater use and increased availability of the network — thus, their increasing concern over terminal response times and critical network parameters. They focus especially on the capabilities of users to transact business efficiently and on the ability of the technical staff to monitor operations and anticipate problems.

Accurate appraisals of user-perceived response times, coupled with meaningful reporting, facilitate long-term planning based on predictable network performance. Consequently, the need for effective network control and the ability to compile performance measurement information is becoming more important.

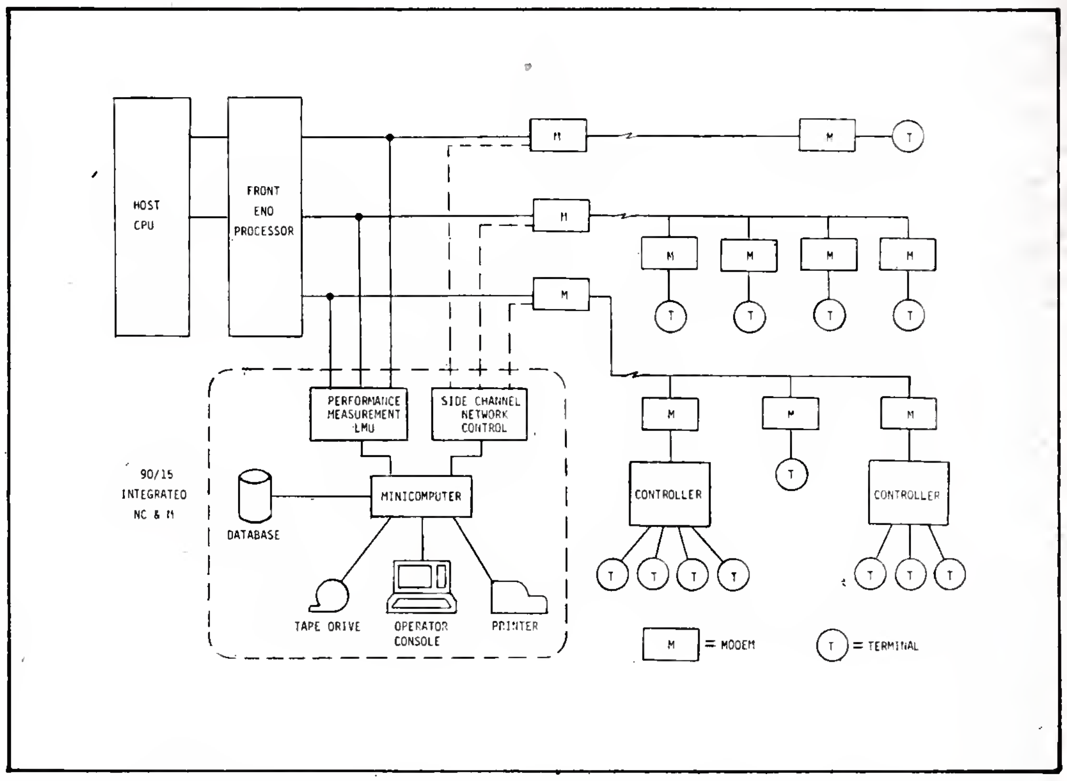
This need has been sensed within the data communications industry, prompting widespread response from network control and management vendors. A vast array of specialized equipment now exists, intended to manage vital network operating parameters.

This equipment can be classed as network control, performance measurement and network management. And since more and more vendors are developing network control and management and performance measurement system products, MIS managers face the initial challenge of distinguishing one class of equipment from another — and then choosing the proper mix. The distinctions of each should be understood at the outset.

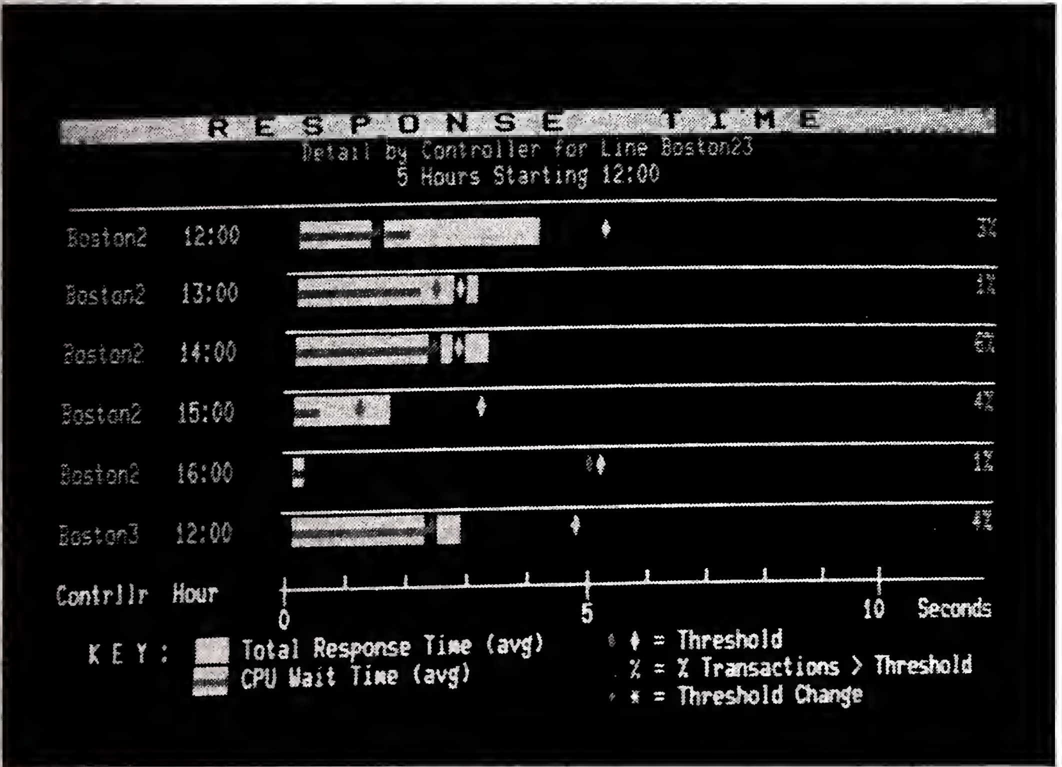
Dealing With Downtime

Network control deals primarily with downtime, monitoring the everyday operation and administration of the network. It performs automatic testing and evaluates the condition of the hardware and the options associated with the network. Network control also provides fault bypass and restoral capabilities and maintains historical files based on accumulated data.

Performance measurement is relatively straightforward. It monitors the communications protocol on the main channel, which makes it possible to identify recurring characteristics associated with communications events. This forms the basic building blocks of the performance measurement function.



An integrated system such as this not only measures the performance of a network, it also allows the MIS staff to control and restore any network faults, including line or equipment failures. Since it has its own CPU architecture, it can also store all network fault and alarm events, information that can be used for future planning and upgrades.



Presented on a console screen, this graphics report depicts average response times of controllers along with CPU waiting times. Threshold settings are highlighted, as are percentage of transactions that extend boundaries during a selected period of time.

With the addition of a data processor and a data base, these events — polls, terminal response times and similar repeated functions — can be stored along with the associated time intervals. Information can then be analyzed to determine the acceptable levels required for continued efficient operation, and specialized software can be called to display or print the data.

Network management compiles and reports network statistics to the operators and managers. The data accumulated by network control and/or performance measurement is based on network events or operator input. Network management is the data base management tool that correlates, formats and presents that data in the form of reports and screen displays. It compiles and displays graphics as well as printed output and maintains separate data files of all management activities.

The point of choosing a particular combination of systems is to merge the best qualities of each network product to form a single management tool. Some advantages and disadvantages of the basic network products should be examined.

In main-channel network control, used in IBM networks, control data is sent on the main channel along with the data. This approach has the advantage of main-channel visibility, but data throughput is affected because the control data information is embedded within the main data stream.

The control data often requires support from DP resources to make it available to MIS. Furthermore, main-channel network control is host-dependent. This means if the mainframe develops a problem or fails completely, network control is useless because the collection of network control information is locked in the mainframe data base until the CPU is repaired.

Advocates of side-channel network control systems point out that because side channel operates independently of the host, it is unaffected by hardware or software problems associated with the host. In fact, with side channel there is the added advantage of continued network monitoring during a host problem. Thus, diagnostic and control functions continue operating in the remainder of the network while the host is being repaired. The disadvantage of side channel is that it does not monitor the main-channel data.

Although many companies now offer performance measurement equipment, many of them market stand-alone equipment. This can mean either a test box measurement device or a complete performance measurement system. Both are very accurate and can fill the gap for an MIS function.

Nevertheless, there are drawbacks. First, using performance measurement means contending with another vendor. Second, if it falls in the class of test box equipment, then several units will be needed to monitor multiline networks or, at best, a single box will have to be connected to each line one at a time. And, with text box units, there is no means of storing the data.

Even if the stand-alone is a complete system, with data base and data processing, another terminal is needed to support performance measurement systems, and the user usually must have different from what software his network currently uses.

Performance measurement equipment is often purchased OEM by data communications manufacturers, patched into the existing network control and measurement system and marketed as a total system. Although these systems link both network control and management to the performance measurement system, piecemeal design usually ends up costing more. Costs are higher in terms of duplicated equipment, additional software, specialized training and special terminals to access both the network control and performance

(Continued on SR/4)

How Risky Is Your Net Development Project?

These questions were designed to be answered by the project manager prior to senior management's approval of the project and several times during the implementation. They are for self-evaluation.

Weights can be assigned numerically so that the higher the total number, the greater the risk of the project.

The questions were adapted from a communications development project, the Dallas Tire Case, No. 9-180-006 (Boston, Mass.: HBS Case Services, 1980).

Size Risk Assessment:

1. Number of user departments involved with project?	**Risk**	**Weight**
One	Low	1
Two or three	Medium	2
Over three	High	3
2. What is the estimated project implementation time?		
12 months or less	Low	1
12 to 24 months	Medium	2
24 months or more	High	3
3. Total development in person-hours for system?		
100 to 3,000	Low	1
3,000 to 15,000	Medium	2
15,000 to 30,000	Medium	3
More than 30,000	High	4

Technology Risk Assessment:

1. Hardware new to company?		
None		0
Front-end processor	High	3
CPU	High	3
Terminals	High	3
Sophisticated modems	High	3
PBX-CBX	High	3
2. Is system software (nonoperating) new to the project team?		
No	High	3
Data communications	High	3
Program language	High	3
Data base	High	3
Other-Specify	High	3
3. How knowledgeable is user in area of data communications?		
First exposure	High	3
Limited knowledge	Medium	2
High degree of capability	Low	1
4. How knowledgeable is user in proposed application area?		
Limited	High	3
Understands concepts but no experience	Medium	2
Has been involved in prior implementation efforts	Low	1

Structure Risk Assessment

1. Has a joint data processing/communications/user team been established?		
No	High	3
Part-time representative	Low	1
Full-time representative		0
2. How committed is upper level management (user) to the system effort?		
Reluctant or unknown	High	3
Adequate	Medium	2
Enthusiastic	Low	1
3. What is the general attitude of the user?		
Anti-data-processing	High	3
Fair — some reluctance	Medium	2
Good — understands value of DP		0
4. Does user organization have to change structurally to meet system requirements?		
No		0
Minimal	Low	1
Somewhat	Medium	2
Major	High	3

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Net Developers Must Chart Risk

(Continued from SR/2)

jects can be highly unstructured. One current trend is to design the integrated office by merging voice, data and other technologies. This cannot be done as one project. Project managers need to avoid the risk inherent in such complexity by segmentation strategies and staggered implementations.

Melone is a communications systems representative for American Bell, Inc., Parsippany, N.J.

Integration Key To Net Control

(Continued from SR/3)

measurement system data bases.

MIS managers should definitely consider an integrated system. Integration provides all the benefits of network control and management with the added feature of performance measurement — and at lower cost and higher capability than piecemeal systems.

Integration maximizes the use of the system. Since both network control and performance measurement share a common data base, the systems can be accessed from a single terminal, where operators use common software instructions to handle all system functions.

Perhaps the ideal solution, then, is integrating a free-standing performance measurement system with side-channel network control and management. This approach has no direct link to the corporate DP resource, and because integrated systems share a common data base, they afford even more efficiency and can give the MIS group more effective control of its resources.

Integrated in this way, systems have the pluses of both main-channel monitoring and side-channel control without the disadvantages.

Van Chu is director of network control products at Intertel, Inc. in Andover, Mass.

Fiber Optics — The Logical Choice for Users

By Richard J. Pybus
Special to CW‡

If a poll had been conducted in any company 10 years ago about the number of data terminals it would be using in 1983, the result probably would have been a number about one-eighth of the actual total.

The result of this poor planning is often a network consisting of almost every type of local data communications device on the market, communicating over a virtual tangle of data cables and borrowed intercom pairs. This approach has worked fine for many up to this time, but what does a company do for the next 10 years of growth now that all of its conduits are full and the building supervisor flatly refuses to let the firm hang cables out the window?

Data communications can be divided into three neat categories: remote DP, which uses telecommunications or other facilities; local point-to-point data transfer; and the local-area network. In many cases, the bulk of the ongoing data transfer is between terminals and a processor.

Fiber-optic systems have not yet evolved to the point where they should be considered for long-distance networks. Lease-based systems fare a bit better, as evidenced by AT&T's choice of this technology for its Northeast Corridor project.

It is unlikely that this type of system will ever be practical for the end user, except in areas where AT&T will be providing Dataphone Digital Service over fiber. At this time, it still makes more sense to use the services of the telecommunications and satellite companies for long-distance data transmission.

The distances involved in local data communications systems are such that fiber-optic systems operate perfectly without repeaters. Most systems that have been installed, even where there is more than one building involved, are less than one kilometer from end to end. Systems of this size often contain short-haul modems with twisted pairs between them, dial-up circuits, statistical multiplexers and even low-capacitance data cables providing the links between the terminal devices and the processing hardware.

Many installations use all these products with varying levels of success. Fiber optics may be used to replace effectively all of these and, as a bonus, provide some impressive advantages over the systems currently in use.

Industry Niche

This niche of the industry has grown quite rapidly in the past couple of years, partly because some of the old problems associated with the handling of the fiber cable have been eliminated. Fiber cable manufacturers have developed their craft to the point where a user may buy a cable for any application — duct, aerial, air plenum, direct burial and even rodentproof.

In conjunction with the development of the cable, manufacturers of connectors and field-splicing devices have made impressive advances, to the point where some customers are installing their own.

Fiber systems provide more bandwidth than most installations can use. Standard fibers are rated at about 200 MHz/km, with premium-quality fibers available up to 1 GHz.

Assuming that a typical link might be two kilometers long (and remembering that the usable bandwidth of a fiber decreases as a function of length), it is possible to use 100 MHz of bandwidth, which is equal to about 250 data devices operating simultaneously at 9,600 bit/sec. Only microwave links or some coaxial-cable-based systems can approach that capacity.

Many data communications managers are looking at fiber-optic systems because they are running out of cable space in their facilities. Faced with the dilemma of having to provide as much bandwidth as possible in as little space as possible, they may opt for fiber.

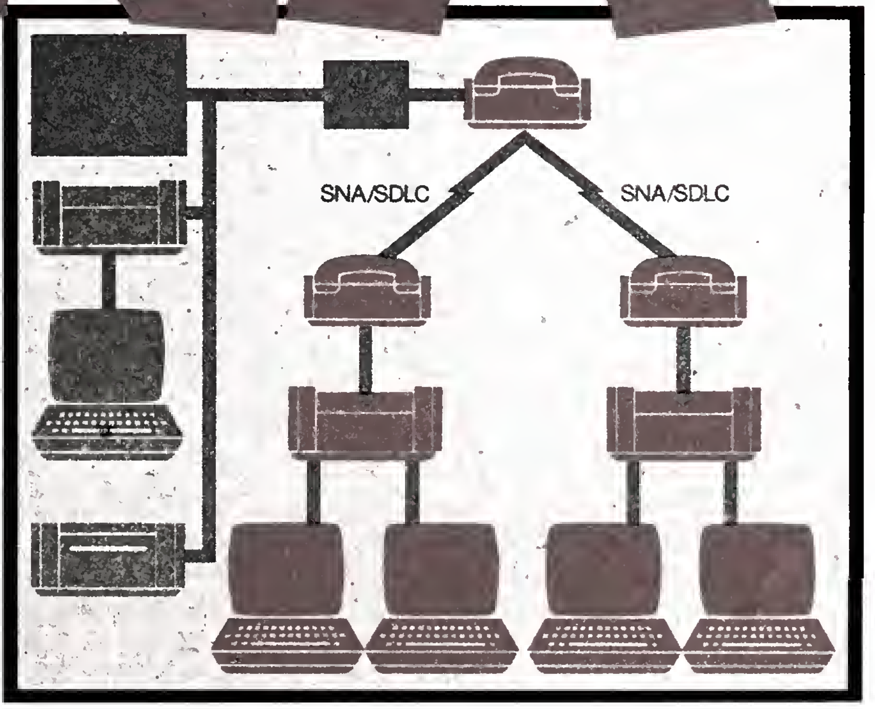
A kilometer of two-fiber cable weighs about 30 lb; an equal length of data cable could weigh over 200 lb. The fiber cable may be added to cable trays without toppling them or in high-rise building shafts where the cable cannot be strain-relieved along its length.

The fact that the core of the fiber is glass causes many people to be unduly concerned about the strength of a fiber cable. A glass fiber, even without its protective cable housing, may be bent into a circle equal to about three times its diameter without damage. Once the fiber is enclosed in a cable, tensile strengths of three or four times those of similar copper cables are possible.

It is virtually impossible to tap a fiber cable without detection. One of the nice properties of optic transmission is that when light is extracted from a point along the length of a ca-

(Continued on SR/6)

SNA:



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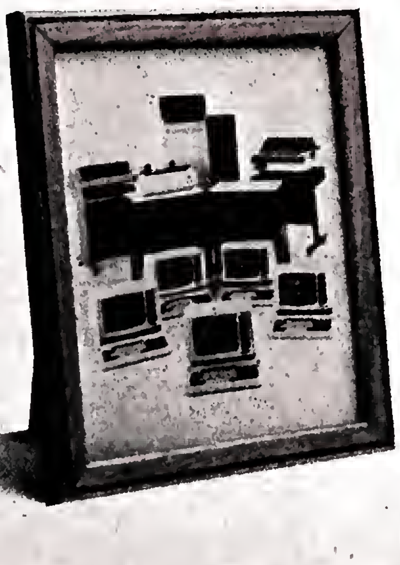

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Steps Outlined

Security Possible in Communications Networks

By Stephen E. Levin
Special to CW‡

As communications networks become more widely distributed, security-related problems are magnified. The primary concern is protecting both resources and data. Access to resources must be controlled to ensure that resources are available for authorized processing. Data must be protected from accidental or intentional misuse.

In distributed systems, access control by the security officer is difficult. The security officer can not have control of system access points, nor can he physically control remote users, who are identifiable only by the way they represent themselves to the system being protected. As a result, remote users can repeatedly attack the system, and if they can write even the simplest program, they can repeat the attack hundreds of times per second.

Protecting data is also difficult within communications networks. Data can not be physically protected when it is being transmitted over long distances. This is true regardless of the physical transmission medium used (microwave, satellite or telephone lines) or the communications protocol set being used (X.25, High-Level Data Link Control, Systems Network Architecture or Transmission Control Protocol/Internet Protocol).

Access Control

The solution to access control involves mechanisms to achieve control and assurance that the mechanisms are effective. Access must be limited to authorized users for authorized uses.

Several mechanisms can be used to limit access to authorized users. Traditionally, the user is identified by something known (password), something owned (identification badges) or a personal characteristic (voice or signature). These methods have limitations and are not always practical in a distributed system.

Passwords are likely to be guessed, circumvented or discovered. Badges, guards and personal recognition may not be possible at remote sites. Moreover, access decisions must be based only on the electronic identification that the remote user presents to local-access control mechanisms, and these are logically no more reliable than the simple passwords.

However, password protection can be maximized. The traditional password protection can be used, but the passwords must be checked and their use must not be circumvented. The logon procedure should not be interruptible. Passwords should not be echoed onto screens, and users must not be allowed to select trivial passwords.

Additional protection can be added to traditional password methods to guarantee that the user is authorized. For example, the system must demonstrate that it will resist giving up passwords. Passwords in transit should be protected with encryption. Also, the user must not be deceived into believing he is giving his password to the system when he actually is giving it to a user/program pretending to be the system. Further protection can be added by procedural and administrative actions.

Use of the system must be monitored with an audit trail to detect unauthorized operations by authorized users. The audit trail should be automatically generated and spoof-proof: Users should not be able to force ar-

(Continued on SR/8)

Fiber Optics: Logical Choice

(Continued from SR/5)

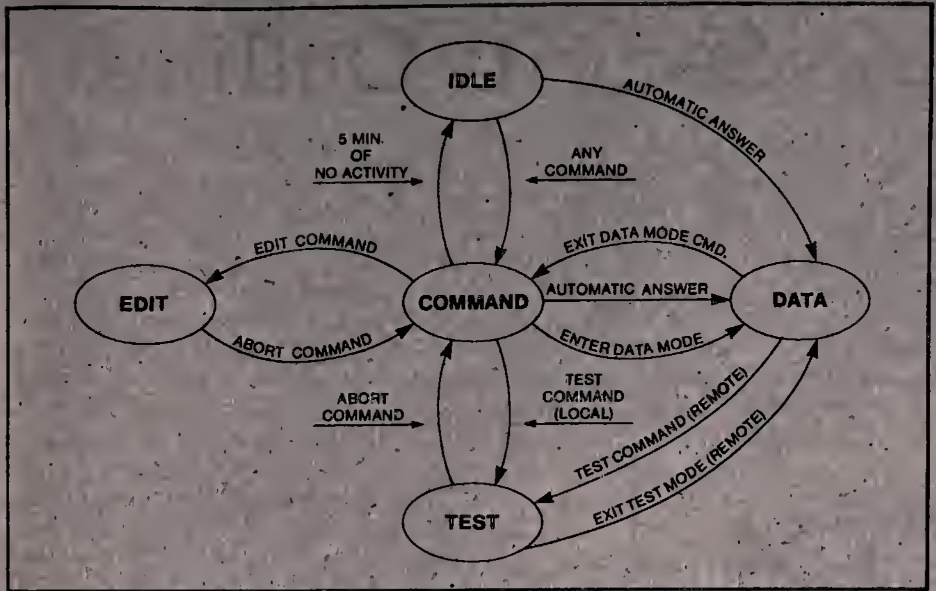
ble, the amount of energy arriving at the end is reduced by a proportional amount. It is easy to detect these losses and to terminate automatically communications if a breach occurs.

Fiber-optic systems typically have a bit error rate 10,000 times better than comparable copper systems. Because fiber-optic systems do not use metallic conductors or electricity, the fiber is completely immune to all of the mishaps listed above.

Multimode fiber will accept many different wavelengths of light. At present, most of the systems available use 830 nm wavelength light, but it is possible to use wavelengths from 1,100 nm to 1,700 nm as well.

In the next few years, a lot of [illegible] will use fiber.

[illegible] is the regional sales manager for [illegible] Optical Systems Division in [illegible]



Command and Control Flow of a Smart Modem

Smart Modems Offer Control of Functions

By Jud Gilbert
Special to CW‡

Smart modems are the latest step in the evolution of data communications equipment. These devices, which allow business computer and home computer users to view and control all available features from a terminal, feature simplified and partially automated operation that saves operator time and reduces line costs.

Three factors create the demand for this new generation of modems:

- Explosive growth of multilocation data system users.
- Greater use of public-switched telephone networks rather than private or leased lines for data transmission.
- Market demand for equipment that eliminates the need for special operator training or skills.

The newest designs are menu-driven, terminal-controlled modems that are virtually transparent to the operator. Because they incorporate microprocessor and memory technology advances, these modems offer expanded features over conventional modems. In fact, they are so convenient and efficient that replacing equipment of an earlier design, even if it is still functionally adequate, can easily be cost-justified.

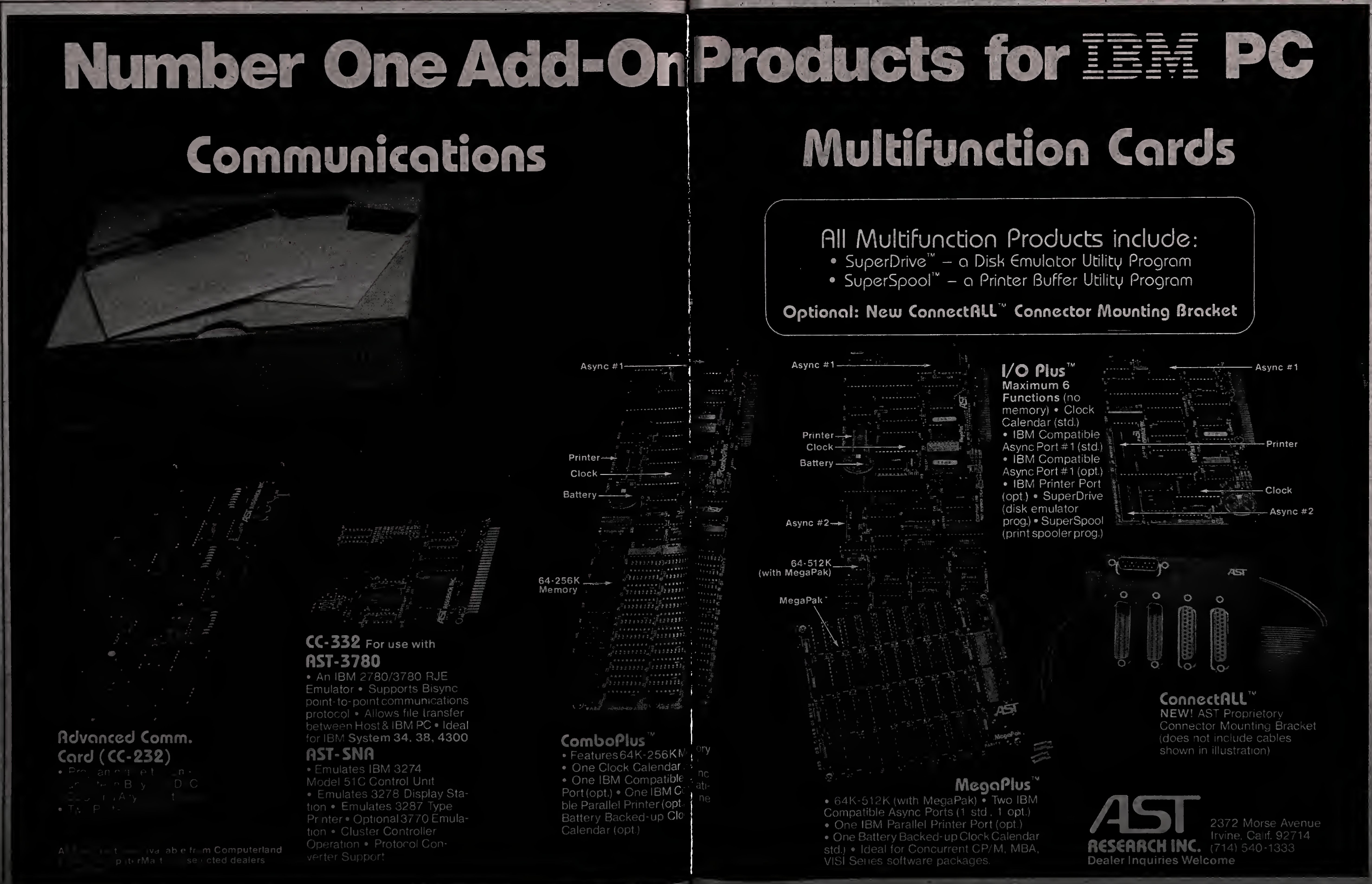
The market share of direct-connect, 1,200 bit/sec, full-duplex, asynchronous, Bell Laboratories 212-compatible modems has grown exponentially during the past few years. Sales, in both units and dollars, are expected to grow at an average annual rate exceeding 300% for the next several years. With a growth rate far higher than any other type of modem, it is understandable that smart, 212-compatible modems are the first to be marketed by modem manufacturers.

Besides menu control of options and operations, smart modems give the user terminal control of all available features. Typically, these include a Help menu with all the basic command information required to operate the system; an option menu that allows the operator to control such functions as voice/data mode, answer-on-ring-number and parity; a test menu; and a directory of phone numbers. Because they are terminal-controlled, desired functions are usually effected by a simple keystroke.

Terminal-controlled modems are essentially user transparent. They incorporate some automated functions, such as autodial, auto-answer and test features, and allow functions that require operator interaction to be controlled from the terminal keyboard. With menu-provided instructions, any user familiar with the terminal keyboard can have complete control of the data communications operation without special knowledge or experience. These modems interact with the terminal through the standard modem/terminal interface connector and use standard Ascii codes and user-recognizable, English-like commands. Cursor addressing of menu options is also provided to support terminals with a cursor feature.

With the expanded memory capacity in today's terminal-controlled modems, many telephone numbers, complex calling sequences — or both — can be stored in the call directory. This allows the modem to attempt a call setup via the lowest cost route. If, after a prescribed number of attempts, the call has not been completed, the modem can sequence to

(Continued on SR/10)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Communications Networks Security Outlined

(Continued from SR/6)

bitrary entries on the audit trail. It should reflect all security-related events, such as logon attempts and connection attempts. Users must be aware that the audit trail is regularly reviewed. The threat of detection often deters unauthorized use.

An example method for monitoring use is a secure communications processor, developed by Digital Technology, Inc., based on the HUB Executive. The HUB Executive is a verified secure operating system designed to support communications applications. The system connects a large host to a packet switching network and offloads communications functions from the host. It allows terminals on the communications processor to access the packet switching network. Access to the host and the packet switching network is controlled and monitored.

Access control by the communications processor is enforced by many methods, including the use of passwords, a secure attention character and mediation of all I/O processing. Passwords are set by the system security officer rather than by users. If the password is exposed by a legitimate user trying to access resources over a communications path not adequate for the user, the access fails and the password is made invalid. Only trusted software can read passwords.

The secure attention character forces the system to attach the user to trusted software, ensuring that the user is always connected to the system rather than to a malicious user/program. The HUB mediates all I/O processing and checks all interprocess communications for correctness.

When the necessary access control mechanisms are implemented, there must be assurance that they are all-pervasive and complete. All attempts to gain access to the sensitive system resources must be checked.

A significant amount of independent testing by system designers/implementers and a penetration attack by someone other than the system designers/implementers are recommended. Formal methods for verifying security can also be implemented. Formal mathematical statements describing the system can be formulated, and rigorous proofs that the system meets a set of previously determined security criteria can then be performed.

While access control is assured both by testing and formal methods, only the latter can show that the system and all trusted software meet the security requirements. System Development Corp., using its Formal Design Methodology and INA-JO specification language, and Digital Technology, Inc., using its specification and verification system, have verified that HUB Executive software meets the specified security requirements.

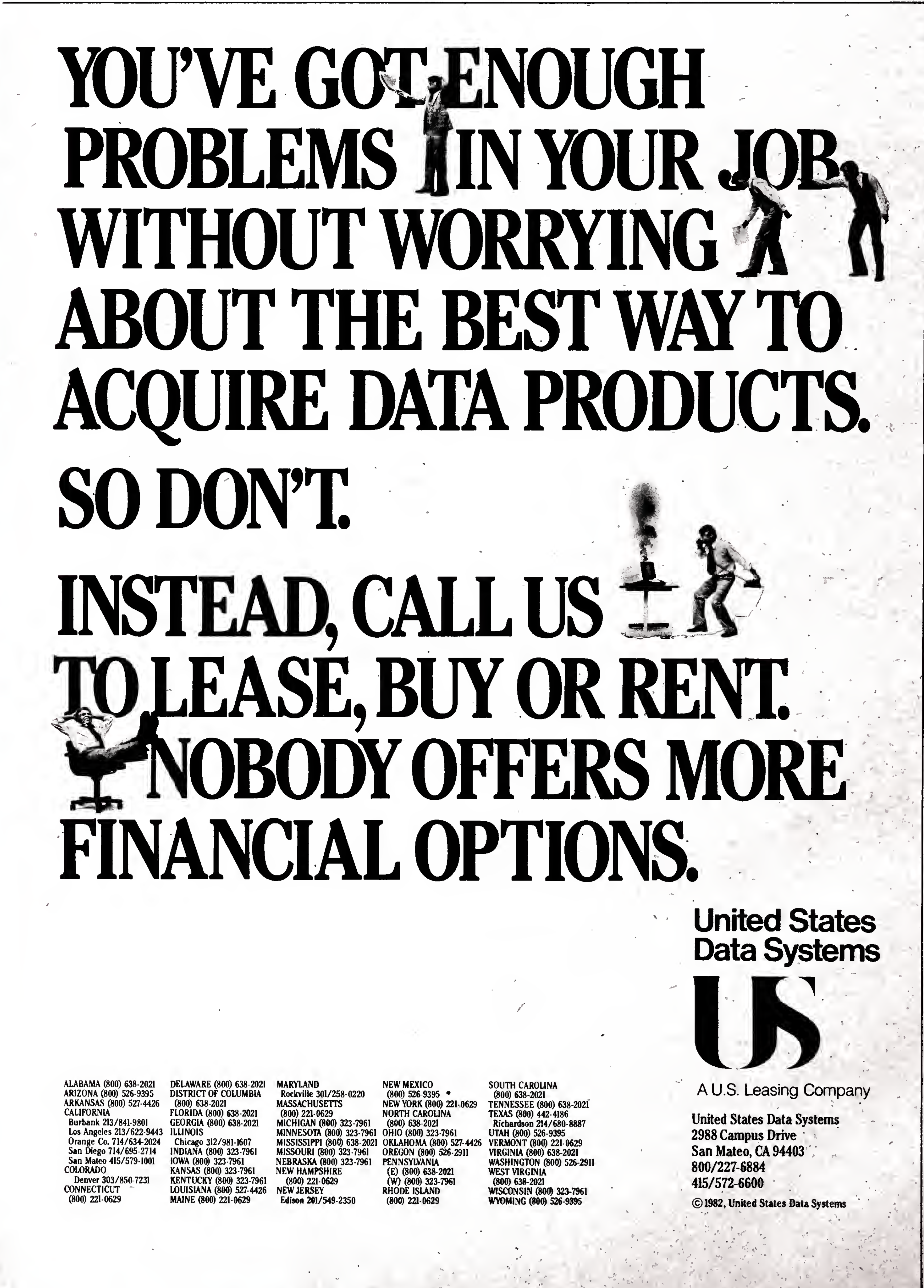
Data Protection

Communications security over networks is made difficult because data is out of sight and out of the user's control. Whether the communication is over leased lines, ordinary telephone lines or on a common carrier, the user is subject to threats that others may read the data or may intentionally modify, insert or delete data.

Protecting the communications paths may be impossible or impractical. However, it is possible to protect the data while it is on the paths, and that is the best solution. This protection is accomplished by encryption.

Encryption is a method of concealing the meaning of data. Many methods (algo-

(Continued on SR/10)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Users to Bear Costs of Turmoil

Confusion in Store for PBX Mart of the Future

By Thomas B. Cross
Special to CW‡

Just a few years ago, state-of-the-art switching technology was all mechanical. In fact, most of the telephone company private branch exchange (PBX) or central office switching equipment is still mechanical. At the rate these telephone operating companies are moving, it will be long into the 21st century before most, but not all, of this equipment becomes computerized.

The telephone companies are pushing hard to reduce maintenance costs, improve productivity and look toward new service offerings that new computerized switching systems offer. Users are seeking new features and integration with data processing services. This has forced the emergence of high-speed, high-capacity services provided by a local-area network.

There has been much talk about the emerging local-area network industry. Cable TV operators have provided video entertainment services for over 30 years via local-area networks, but have no experience in making connections or switching. Telephone companies come from switching and have no experience in wideband entertainment services. Each seems to be rushing toward this middle area called local-area networks. What, then, is a local-area network?

A local-area network is a pipe composed of twisted pairs, coaxial cable, optical fiber or some combination of each. The pipe can make connections for telephone service, hook computers together with other computers, switch data or voice, link meeting rooms together for teleconferencing and so on.

The issue facing this industry is not merely technological or economic, but also political. Simply put, certain protocols or "rules of road" need to be established so that the bits of information can read the road signs.

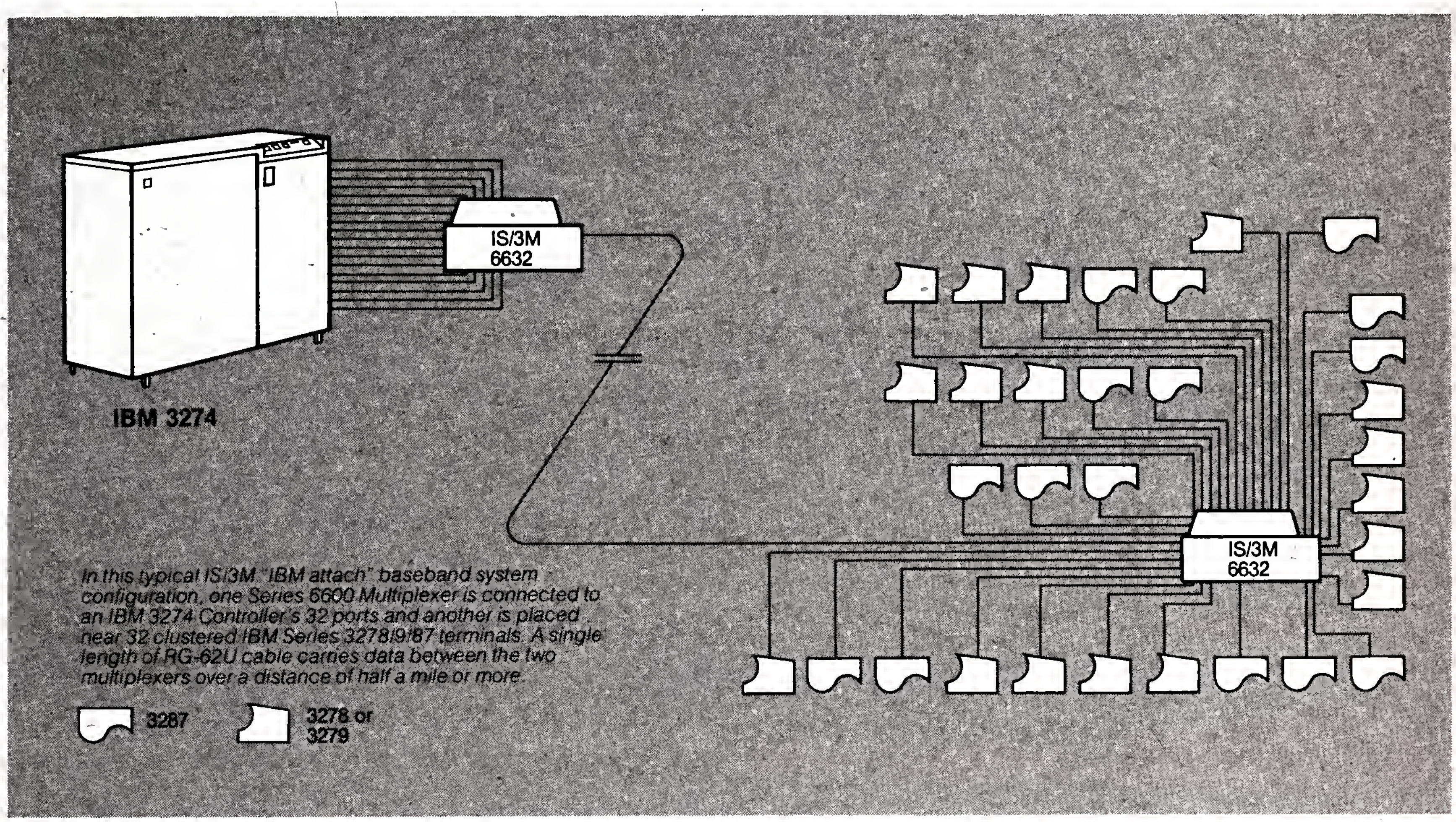
Currently, there are over 20 different kinds of road signs, such as broadband, baseband and data cable vs. telephone wire pairs. This creates chaos when trying to connect one device to another. The players represent the most formidable companies in American industry. Each company wants its rules as the chosen champion. The winner in this game will reap billions of dollars in revenue. The fury will rage on for many years.

What does this mean for the PBX of the future? First, it means confusion, the users will also bear the costs of this turmoil. Each company will tell you that its local-area network or PBX is the only choice. The users are asking, "Do I spend a lot of money now for something I can't really use or wait until later, and if I wait, will it work with what I've got now?"

Second, there is the issue of increasingly difficult choices in creating networks. With Federal Communications Commission deregulation, there are now over 50 different long-distance companies.

In the near term, the user will probably have at least two, probably three, different companies that will connect PBX processing to long-distance telephone calls. With American Bell, Inc. coming on-line, the new kid on the block will have a set of options for the consumer,

(Continued on SR/10)



In this typical IS/3M "IBM attach" baseband system configuration, one Series 6600 Multiplexer is connected to an IBM 3274 Controller's 32 ports and another is placed near 32 clustered IBM Series 3278/9/87 terminals. A single length of RG-62U cable carries data between the two multiplexers over a distance of half a mile or more.

IBM is a registered trademark of International Business Machines Corporation.

Connect as many as 32 terminals to a distant IBM 3274 Controller with a single existing baseband cable.

Until recently, there was just one way to connect more than one IBM 327X terminal or printer to a 3274 Controller: Install another dedicated cable for each new peripheral.

Now there's another, simpler, and very reliable way to do the same job without pulling long lengths of new cable. It's called the Interactive Systems/3M Series 6600 "IBM® attach" baseband system. And it lets you hook as many as 31 extra terminals or printers onto any existing RG-62/U cable that now connects your IBM 3274 Controller to a terminal.

The method: time-division multiplexing.

IS/3M's new Series 6600 "IBM attach" uses time-division multiplexing (TDM) to squeeze more data channels onto a standard baseband cable. Installation is quite simple. One or more IS/3M Series 6600 head-end multiplexers is attached to the controller. Depending on the model selected, a single MUX can handle data for up to 4, 8, or 32 ports.

Series 6600 Multiplexer, available with 4, 8, or 32 input/output ports.

The multiplexed data streams are carried via the existing RG-62/U cable to an identical Series 6600 MUX at the remote location. Local baseband cables connect this multiplexer to its assigned terminals and printers.

Flexibility, plus uncompromised system performance.

Any combination of IS/3M multiplexers can be used with the IBM 3274 Controller, so long as the total number of channels doesn't exceed 32. For example, three 8-channel MUXes could be used with existing cables to feed up to eight terminals and/or printers at each of three different sites.

The baseband system is fully transparent and plug-compatible to IBM equipment. Just as important, it allows all peripherals to send and receive data at the standard IBM channel speed of 2.3 Mb/s.

A proven technology from an experienced company.

Time-division multiplexing has been employed successfully in long-distance telephony and computer time-sharing for years.

Interactive Systems/3M is no newcomer to data communications. On the contrary: Factories, office buildings, universities, and government installations have been benefiting from IS/3M's communications engineering, modem manufacturing, and installation expertise since 1972.

Phone **(800) 328-1684** toll free (in Minnesota **(800) 792-1072**) or mail the coupon for more data on the Interactive Systems/3M Series 6600 "IBM attach" system. Who knows? You may discover that you'll never have to pull a major length of baseband cable again.

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(Continued from Page SR/9)

including data services.

Third, rapidly changing technology must also be considered. Packet-switched voice communications is on the horizon. This technology is at present being used exclusively for data, but cross-country testing has proven the viability of its application for voice.

Some PBX systems are now going digital from the handset. Even though most manufacturers tell you that they have a digital PBX system, it is actually digital only down in the PBX room inside the machine.

A leading management research firm recently suggested that users should "experiment" with digital PBX systems. With the average cost per PBX line hovering at $1,000, upper management is finding it difficult to justify expensive experiments. Even the smaller PBX systems cost $600/line. What you can afford to do is to be careful.

Cross is managing director of Cross Information Co. of Boulder, Colo.

Future Options for PBX Consumers

In the future, there will be a wide range of options available to the corporate PBX consumer. These options include:

- Call forwarding, conference calling and call transfer.
- Voice store/forward involves a centralized telephone answering system, but with sophisticated features.
- Voice dictation — can be integrated with voice store/forward.

A list of network features includes:

- Least-cost and optimized network and off/network routing of calls.
- Tandem network features for multinode environments.
- Tasi/Vocoder — voice concentration.
- Encryption — for security protection.
- Technical control.

A list of data features includes:

- Modem pool — sharing modems to reduce costs.
- Speed conversions — upward and downward.
- Language conversions — various word processor manufacturers.
- Packet interface — X.25 to carriers.

Menu, Terminal Control Featured in Smart Modems

(Continued from SR/7)

the next less expensive route and then, if required, to a direct dial.

Telephone numbers can be stored in the smart modem's memory. If the unit has a nonvolatile memory, such as in Prentice Corp.'s recently introduced Model 212TCM, numbers are retained even when power is removed. This is an extremely important feature because the portability and ease of setup of smart modems will undoubtedly result in their being moved frequently from one location to another. The only requirement for operating a smart terminal-controlled modem on a public-switched network is a terminal and an available telephone jack.

Autodial and auto-answer features have been available on advanced 212-compatible modems for some time. Placing control of these modems at the terminal, however, enables the terminal user to select from the displayed directory any of the telephone numbers in memory by name or code.

Because the terminal can control all modem functions necessary to transmit or receive data, a handset is not required unless voice communication is also desired from that same location. In that case, the modem's autodial function can also set up voice calls. An integral speaker, activated during call setup, permits the user to hear the ring and answer when placing a voice call. When the call is answered, a single keystroke connects the telephone handset to the line. When answering a voice call, the user need only lift the receiver before the modem auto-answers the call.

With the many user-friendly features of 212-compatible terminal-controlled modems, home computer and business computer users can have sophisticated data communications equipment that previously was considered practical only for individuals and firms with extensive technical experience and high-volume data transmission requirements.

Gilbert is vice-president of business development for Prentice Corp., Sunnyvale, Calif.

Data Protection Possible in Nets

(Continued from SR/8)

rithms) can be used to encrypt data. Public key cryptosystems are based on mathematical operations thought to be impossible to undo.

The two major types of encryption are link encryption, which protects the meaning of data while on a single point-to-point path, and end-to-end encryption, which protects data while over all the links in a communications network.

Link encryption is more commonly used. It provides data privacy so that browsing is prevented, but it can not protect against the more sophisticated threats of modification, insertion or deletion of data. Standard methods for providing link encryption have been developed.

End-to-end encryption corresponds to Layer 4 (the transport layer) in the International Standards Organization open systems interconnect architecture. Because Layer 4 is end-to-end, it can provide protection through encryption to any number of communications links or intermediate networks.

Levin is director of the Government Systems Group at Digital Technology, Inc., Champaign, Ill.

TELECOMMUNICATIONS OPPORTUNITIES

UNION BANK, in Los Angeles, has immediate openings for communications specialists who can:

- solve technical problems of voice and data communications systems
- perform cost studies, breakdowns and allocations
- evaluate networks and optimize systems
- participate in the development of national networking

We require a thorough understanding of the communications industry and its regulatory environment. Familiarity with EDP software project management, and a degree in systems-related courses (MIS, programming, statistics, etc.) desirable.

We are offering outstanding salaries, excellent stability, challenge, room for growth, and a comprehensive benefits package.

For confidential consideration, send your resume to:
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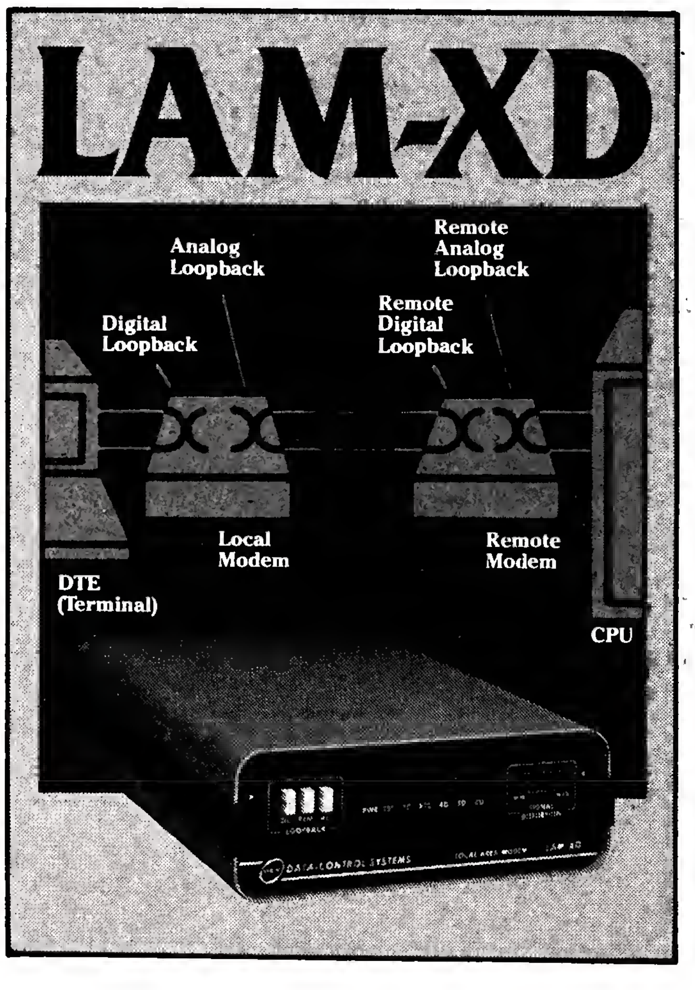

INTRODUCING: THE NOT SO LIMITED DISTANCE MODEM

The LAM-XD adds extensive diagnostics and extra miles to your Local Area Data Distribution.

Don't pay for a long haul modem when the LAM-XD will fit the bill.

- Transmitts over seven miles at 19.2 kbps
- Automatic adaptive equalizer
- Local and remote analog and digital loopbacks
- Synchronous or asynchronous
- DC continuity not required
- Conforms to Bell Publications 43401 and 41208

The LAM-XD replaces technician costs with technology! Automatic equalization and extensive diagnostics simplify installation and reduce field service calls. All tests can be initiated from the front panel of either modem or through the EIA. Optional status and control lines allow monitoring and resetting of remote equipment via the data link. An alternate data path is also available for use in tech control systems.

RS232 and RS449 interfaces are available.

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Community Systems Merge Local Nets, Micros

By Harry J. Saal
Special to CW‡

These are times of great change. Futurists say the information explosion is upon us.

In corporate environments, computers are no longer kept for the exclusive use of computer professionals. From senior management to workers on the assembly line, employees are rapidly coming to see computers as a standard part of the office environment.

In business, a wide spectrum of individuals must share information. Rarely is truly personal data encountered in corporate situations. One person might enter the basic data, another will edit or modify it and a third will produce reports or graphic displays from it. Information is typically supplied by many sources, but must be merged, managed and distributed to be useful. Also, because information is a valuable resource, it must be protected from malicious or accidental misuse.

Although often separated by distance, allied users must work together. On different floors, in different buildings or in different states and countries, fellow workers must exchange information. For them, communications is no longer a luxury: It is essential and growing daily in importance.

Recent Developments

Two recent developments, local-area networking and personal computing, provide a way to address the needs of this new class of computer users. Community microcomputing is the merger of these two technologies. Many local-area network vendors are looking to community microcomputing as the answer to the computing needs of the '80s.

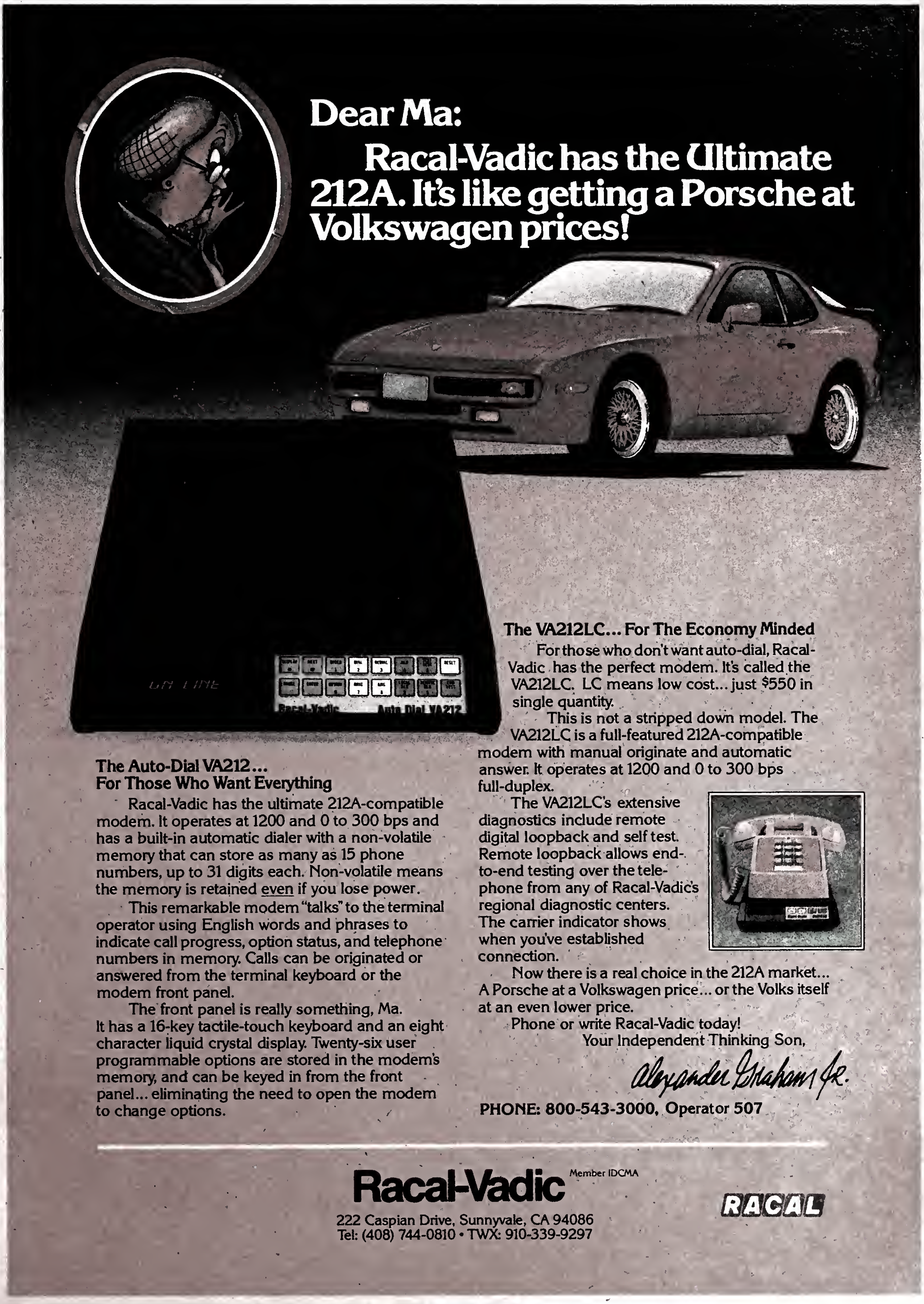
Community microcomputing allows a community of users to share information that resides on common peripherals. Users share common programs and data, as well as expensive, high-quality equipment such as printers and disks. An individual connected to a community microcomputing system has his own dedicated personal computer, as well as a support environment for communications and for sharing peripherals and information. Mainstream personal computers, serving as desktop workstations, provide a familiar, nonthreatening setting that enhances the effectiveness of professional and clerical workers.

Such community microcomputing personal workstations must be open-ended multifunction tools that allow word processing, data manipulation, graphics and electronic messaging. Because business tasks can be quite specialized, all individuals in the community will not use the same type of workstation. A choice of workstations, with a strong emphasis on compatibility and data exchange capability, must be available to a company for its workers.

Community microcomputing systems must be modular, adding users, functions and new applications without major dislocations to the system as it grows. Modularity preserves the initial system investment as company needs grow and change. Accommodating simple incremental growth ensures a long and stable future for community microcomputing systems. And through the use of a vendor-independent personal local-area network, users can integrate newer, more cost-effective or higher performance workstations into their networks as time goes on.

For a wide range of applications, community micro-

(Continued on SR/14)



Dear Ma:
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The Auto-Dial VA212...
For Those Who Want Everything

Racal-Vadic has the ultimate 212A-compatible modem. It operates at 1200 and 0 to 300 bps and has a built-in automatic dialer with a non-volatile memory that can store as many as 15 phone numbers, up to 31 digits each. Non-volatile means the memory is retained even if you lose power.

This remarkable modem "talks" to the terminal operator using English words and phrases to indicate call progress, option status, and telephone numbers in memory. Calls can be originated or answered from the terminal keyboard or the modem front panel.

The front panel is really something, Ma. It has a 16-key tactile-touch keyboard and an eight character liquid crystal display. Twenty-six user programmable options are stored in the modem's memory, and can be keyed in from the front panel... eliminating the need to open the modem to change options.

The VA212LC... For The Economy Minded

For those who don't want auto-dial, Racal-Vadic has the perfect modem. It's called the VA212LC. LC means low cost... just $550 in single quantity.

This is not a stripped down model. The VA212LC is a full-featured 212A-compatible modem with manual originate and automatic answer. It operates at 1200 and 0 to 300 bps full-duplex.

The VA212LC's extensive diagnostics include remote digital loopback and self test. Remote loopback allows end-to-end testing over the telephone from any of Racal-Vadic's regional diagnostic centers. The carrier indicator shows when you've established connection.

Now there is a real choice in the 212A market... A Porsche at a Volkswagen price... or the Volks itself at an even lower price.

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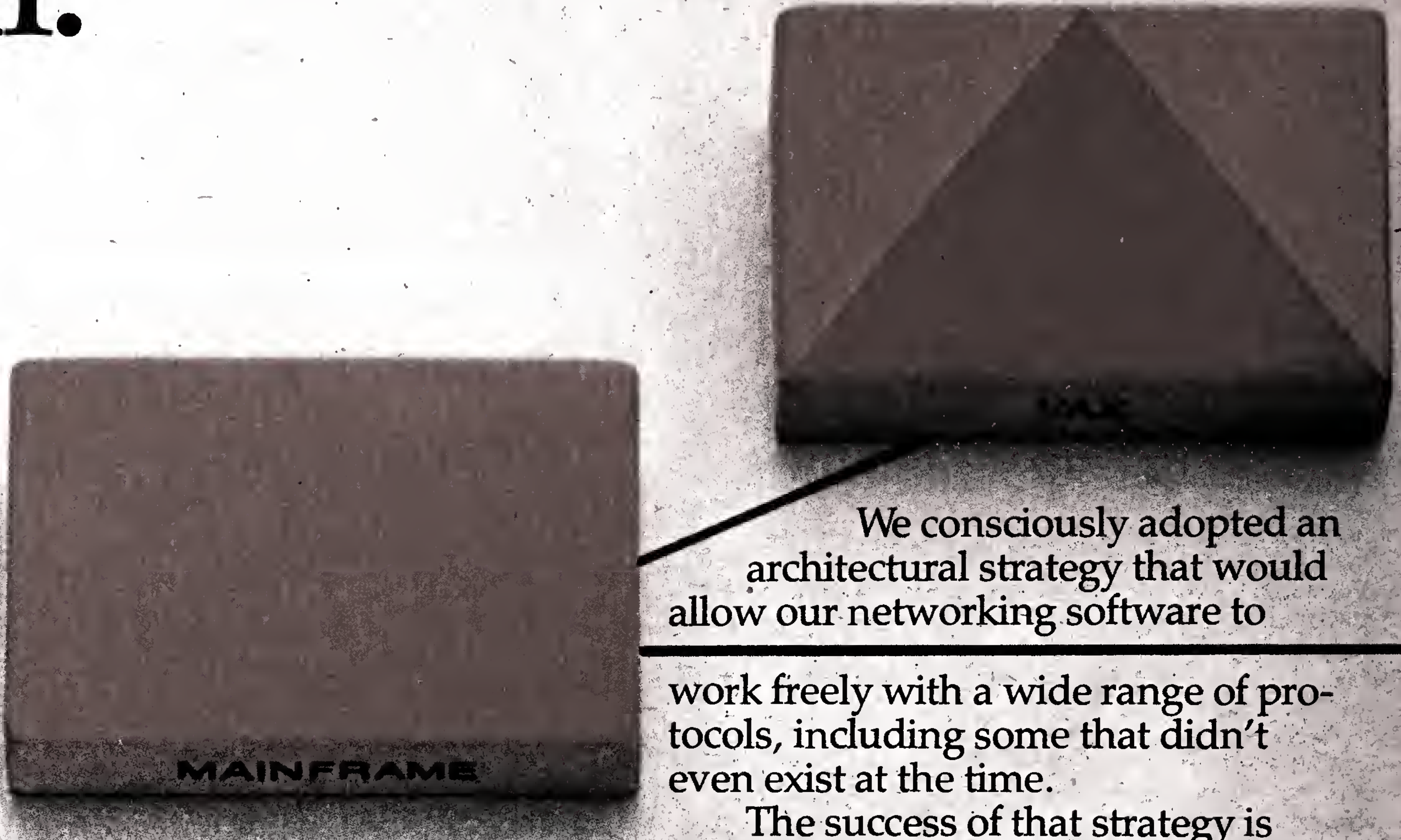


By now, everyone understands the need for standard communications protocols. Without them, an electronic Tower of Babel would surely ensue. But there have to be different standards for different networks. A local-area network is different from a wide-area network. A public network is different from a private one.

No single universal standard has emerged. Nor is one likely to. There are simply too many diverse networking environments, each fulfilling specific, mutually exclusive needs.

That's why Digital is committed to supporting and, in fact, actively promoting the more important standards now surfacing in the various environments.

Our goal is to offer our customers a range of standards to achieve any combination of networking objectives. And we've been pursuing that goal for many years.

A forward-thinking strategy.

When we first developed our networking architecture, we understood the need for flexibility. We consciously adopted an architectural strategy that would allow our networking software to work freely with a wide range of protocols, including some that didn't even exist at the time.

The success of that strategy is now becoming apparent. As more vendors enter the networking field, Digital is uniquely positioned to offer compatibility with the emerging protocols. We've gone farther than anyone to assure that your options are open.

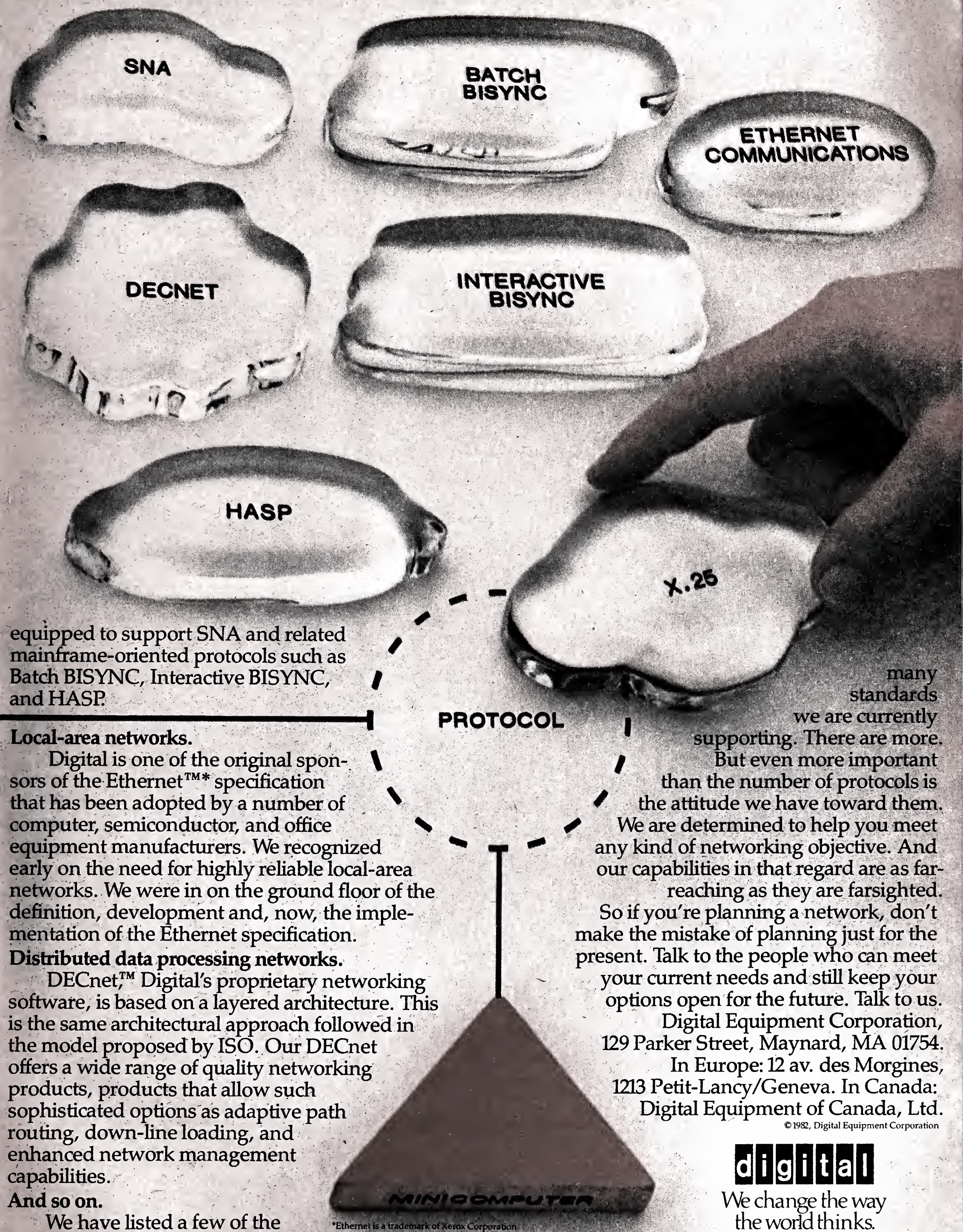
X.25 and other public networks.

Digital offers the X.25 protocol for use with public packet-switched networks such as Datapac (Canada), Transpac (France), and PSS (U.K.).

But when used with our computers, X.25 is much more than a simple link. We can provide you with the higher-level protocols that will take your systems beyond mere communications and into the sophisticated functionality that has made us a leader in networking software.

Hierarchical networks.

Even though we prefer to implement more flexible distributed networks, we are amply



equipped to support SNA and related mainframe-oriented protocols such as Batch BISYNC, Interactive BISYNC, and HASP.

Local-area networks.

Digital is one of the original sponsors of the Ethernet™* specification that has been adopted by a number of computer, semiconductor, and office equipment manufacturers. We recognized early on the need for highly reliable local-area networks. We were in on the ground floor of the definition, development and, now, the implementation of the Ethernet specification.

Distributed data processing networks.

DECnet,™ Digital's proprietary networking software, is based on a layered architecture. This is the same architectural approach followed in the model proposed by ISO. Our DECnet offers a wide range of quality networking products, products that allow such sophisticated options as adaptive path routing, down-line loading, and enhanced network management capabilities.

And so on.

We have listed a few of the many standards we are currently supporting. There are more. But even more important than the number of protocols is the attitude we have toward them. We are determined to help you meet any kind of networking objective. And our capabilities in that regard are as far-reaching as they are farsighted.

So if you're planning a network, don't make the mistake of planning just for the present. Talk to the people who can meet your current needs and still keep your options open for the future. Talk to us.

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Network Concentrators Monitor Performance

By Budd Barnes
Special to CW‡

The large-scale DP user now takes the computer mostly for granted. The big concern today is getting these computers interconnected within a network cost-effectively and reliably.

There is too much at stake now to risk the failure of a nationwide or international network, no matter who the users are.

The answer to the "cost-effective" part of the requirement came about in the form of the multiplexer, which enabled users to eliminate numerous high-cost, one-on-one hookups between network elements and to substitute fewer, high-capacity, low-cost channels instead.

As with all benefits, however, there is a price to pay.

A network now consists of interconnected groups of co-located computers and terminals, all of which have their traffic routed via their cluster multiplexer, which in turn addresses the high-capacity channel. Now, a line failure in the absence of one-on-one connections isolates an entire cluster and can, in effect, knock a whole city or office complex out of the network.

This condition presented sufficient risk with time-division multiplexers. The risk was increased for users when supercapacity statistical multiplexers allowed even greater network concentration with fewer main trunks.

The problem that arises with sta-

(Continued on SR/18)

Community Systems Merge Local-Area Networks, Micros

(Continued from SR/11)

computing solutions are far more economical than conventional multiuser minicomputer approaches. Community networks are less expensive to purchase, and due to lower overhead, they are also less expensive to operate. Fitting easily within existing office environments, community networks are less expensive to install than dedicated computer facilities.

More than price alone separates the personal local-area network solution from traditional computing systems. To achieve productivity gains, workers must accept a system, rather than resist it. Using familiar personal computers as workstations significantly aids that acceptance.

Because the personal network functions transparently, the user sees the network as an extension of his own personal environment, rather than feeling like a mere "node" in a complex distributed data processing system. The user feels he is controlling his environment, not being controlled by it. This feeling of control and individuality by the user is the single most important difference between traditional systems and community microcomputing systems.

Technology itself, then, is not the focus of community microcomputing systems. Communications networks are used in a simple and transparent fashion. Local and remote peripherals are accessed in identical fashion. Users need not be trained programmers in order to use the system actively and creatively.

Communications

A community microcomputing system must allow all users to communicate with each other, directly or through shared information. Communications between geographically remote personal networks support the extended community. Communication gateways allow data to flow to and from major mainframe installations. In this way, community microcomputing expands the available computing alternatives, cooperating and co-existing with both traditional mainframe environments and individual (non-networked) personal computers.

Open communications are the hallmark of community microcomputing. Access to sensitive information is controlled through the use of passwords and encryption, while users communicate freely otherwise. Shared programs are available on a large-scale basis, while sophisticated access controls that meet the security requirements of the community must be provided.

Community microcomputing is a true systems-level solution. Dedicated to the requirements of its users, the personal local-area network readily adapts to a rapidly changing world.

Saal is president of Nestar Systems, Inc., Palo Alto, Calif.

Which Local Area Network makes incompatible systems compatible?

ContelNet. Because the ContelNet design handles protocol conversion at the bus interface, systems with different protocols can share information.

Different kinds of equipment such as minicomputers and microcomputers, word processors, data terminals, PBX systems. Different speeds. Different operating systems. Even different vendors. Whatever your mix of modern office equipment, Contel Information Systems can install the LAN you need now—baseband or broadband—support it and expand it whenever you're ready.

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A Two-Stage Project

Choosing the Ultimate Value-Added Network

By Ron Young
Special to CW‡

Data communications has become, like medicine and law, a field crowded with specialists. In the past, the general practitioner and the family lawyer could meet the needs of most patients and clients. Similarly, AT&T has been the general practitioner in the data communications field. Until recently, the prospective data network user has had only two options: set up his network, utilizing phone company circuits, or go with a handful of networks, taking what they have to offer.

Today, there are many value-added networks on the market. They do more than just allow access to leased-line or satellite transponder time. They "add value" by providing the client with equipment such as modems or by providing such services as designing and installing the network, monitoring transmissions for breakdowns or errors and maintaining the lines.

Some networks only assume service responsibility for a portion of the transmission path. Others, such as RCA Corp.'s Cylix, do systems diagnostics, protocol conversion, maintenance and error detection over the entire path, from the entry at the remote client terminal to reception at the host.

Because of the diversity of services now available, getting custom-tailored communications service no longer requires that companies design and set up their own networks. For many medium-size companies in which satellite communications would be ideal, this could be prohibitively expensive. Without the alternative of value-added networks, the very service ideally suited to their unique communications needs would be out of reach.

Realizing such specialized service is a two-stage project. First, the user must select the network that provides the most appropriate method of communication. Second, the user must work closely with service-oriented and technically expert network personnel who will take the time to understand and adapt their system to the user company's needs.

Narrowing the Field

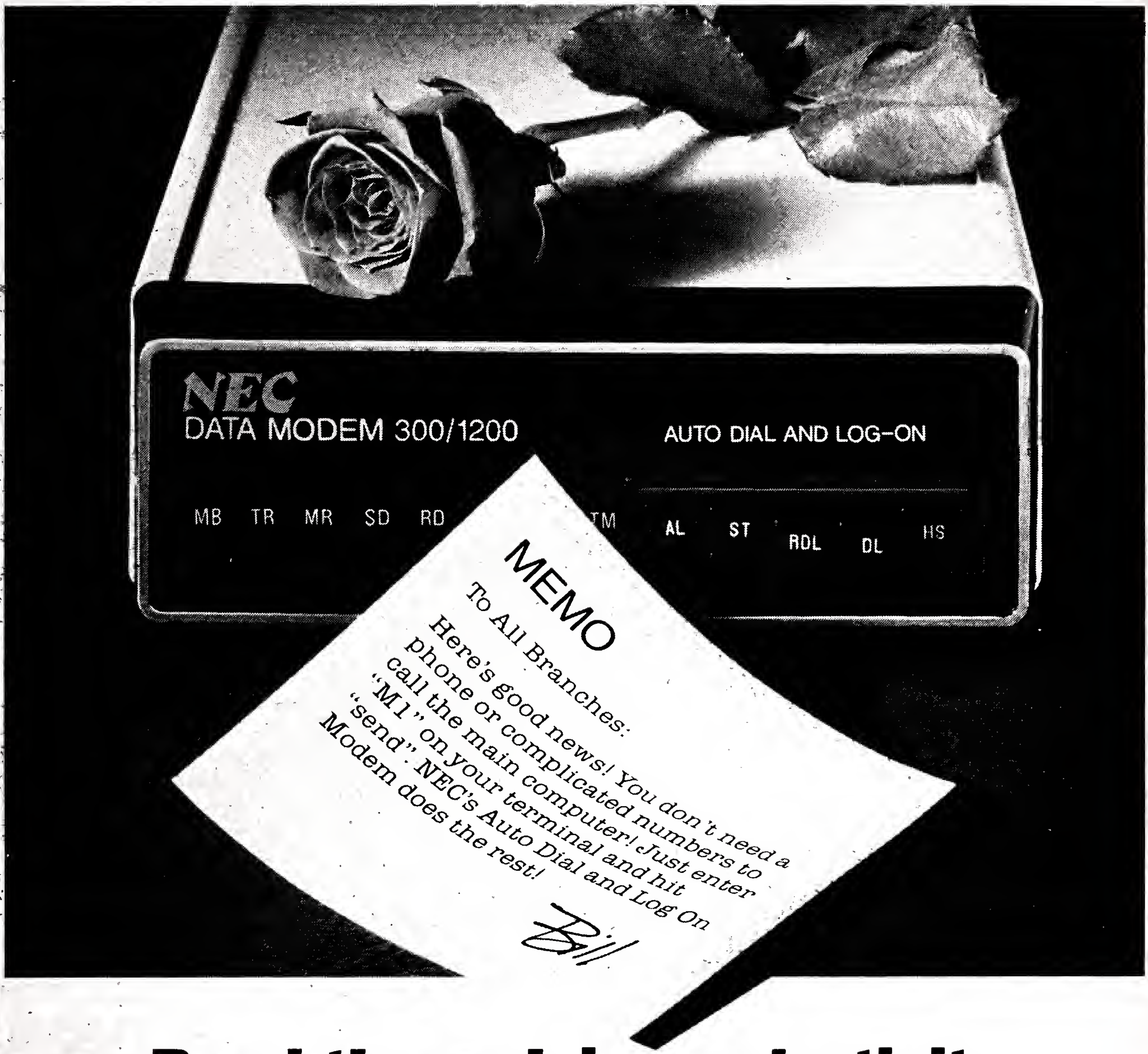
The process of selecting the best network for a particular situation begins with some simple decisions, leading to much more complex ones based on a clear knowledge of the kind of information to be transmitted and the capabilities of the equipment to be interconnected.

The most fundamental question the data processing manager should ask is: Does his company need voice-, video- or data-only communications or a combination of all these? For example, if only data communication is required, it is foolish to subscribe to and pay for voice-and-data network service.

Equally basic is whether one or more remote terminal sites are to be linked with the central data base. If only one is involved, a point-to-point network is ideal; otherwise, a network designed for multipoint interconnections is necessary.

This first round of elimination on the basis of form of transmission and the need for multipoint connections will considerably narrow the field of contenders.

(Continued on SR/16)



MEMO
To All Branches:
Here's good news! You don't need a phone or complicated numbers to call the main computer! Just enter "M1" on your terminal and hit "send". NEC's Auto Dial and Log On Modem does the rest!
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Breakthrough in productivity: new Auto Dial and Log On modem.

You don't need a telephone to transmit data over dial-up lines the new NEC way. Just turn on the terminal, enter a two or three digit code, and hit the return key. That's all there is to it. The NEC 300/1200 Auto Dial and Log On data modem does the rest.

If a line is busy, the modem may keep on dialing that number—or a preprogrammed sequence of alternate numbers—until it receives an answer. The modem then automatically sends the log-on message. This user-friendly modem tells you via a terminal print-out or display exactly what's taking place.

Sound simple? It is. Even temporary help can transmit data with a minimum of instruction and a maximum of efficiency. No time wasted hunting misplaced phone numbers, redialing busy lines or typing the wrong log-on message. Since phones aren't needed, unauthorized calls are eliminated. Lets the user concentrate on sending data.

Set a new standard of efficiency with NEC's new Auto Dial and Log On modem. Mail the coupon for more details, or call (408) 980-1500.

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Selecting the Ultimate Value-Added Network

(Continued from SR/15)

The next, more complicated level of consideration concerns speed, both in the sense of speed of transmission and in terms of the user's need for on-line rather than batch transmission. On-line service provides immediate and continuous access to the data base. With a batch system, information is sent, without interactive capability, on a delayed basis at one time — usually nonpeak periods.

Although inexpensive, batch transmission is inherently limited by the inability of interaction between the remote and central systems. An insurance company, for instance, can efficiently use a batch system to send payment information to a central data base after working hours. An airline reservations agent, on the other hand, needs to tap into and manipulate a data base continuously during the day, making on-line service necessary.

Similarly, having to dial up and log in each call would be impossibly inconvenient and time consuming for high-volume users. These users should consider networks that provide permanent virtual message circuits. With such a system, all of a user's transmissions between any two points always travel exclusively over the same path, eliminating the need to dial each separate message.

Such permanent virtual-circuit networks transmit at medium to high speeds, 4,800 to 9,600 bit/sec, while dial-up networks send at a low 1,200 bit/sec. Transmission speed is determined by the nature of the computer and terminals used. The IBM 4300 mainframe, for example, communicates at high speeds utilizing the Synchronous Data Link Control protocol. A user that has such a system will automatically be required to employ a network that accommodates that protocol at high speeds. Not all of them do.

Another important factor in the selection process is the distance over which communication travels. One company, for instance, had a central data base at the corporate headquarters in Massachusetts and needed to communicate with remote sites in Texas, California, Minnesota and Pennslyvania.

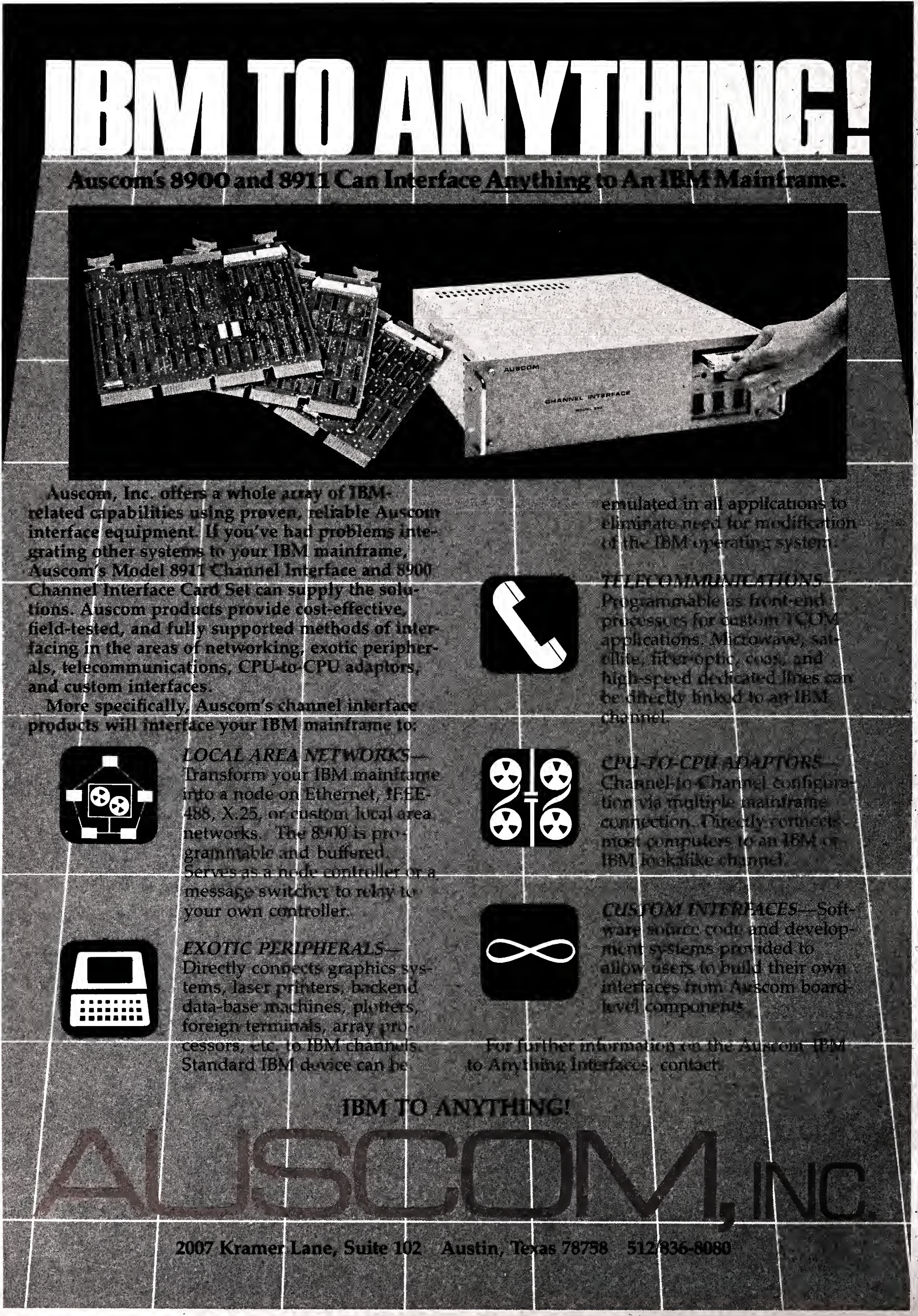
The company discovered that AT&T leased-line service to locations west of the Mississippi River cost $300 a month more than to points east of the Mississippi. In this case, a value-added satellite network that bills on the basis of volume, rather than distance of transmission, is clearly more cost-efficient.

An additional element that is often overlooked is reliability. Factors of line and/or atmospheric interference cause considerable differences in the error rates of various forms of transmission. There is some margin for error in voice and video transmission, in which enough data or information is conveyed for the receiver to extrapolate the meaning of a message or image, even if certain bits are missing or scrambled.

Even with textual data, transmission problems that cause errors in punctuation or spelling are not catastrophic. But with numerical data, such as would appear in inventory control, financial information and travel booking, variations in decimal points or individual numbers can have a huge impact. In fact, there is no margin for error.

Such situations require highly accurate and effective error detection.

Young is vice-president of marketing with the RCA Cylix Communications Network, Memphis, Tenn.



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LOCAL AREA NETWORKS—Transform your IBM mainframe into a node on Ethernet, IEEE-488, X.25, or custom local area networks. The 8900 is programmable and buffered. Serves as a node controller or a message switcher to relay to your own controller.

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CPU-TO-CPU ADAPTORS—Channel-to-Channel configuration via multiple mainframe connection. Directly connects most computers to an IBM or IBM lookalike channel.

CUSTOM INTERFACES—Software source code and development systems provided to allow users to build their own interfaces from Auscom board-level components.

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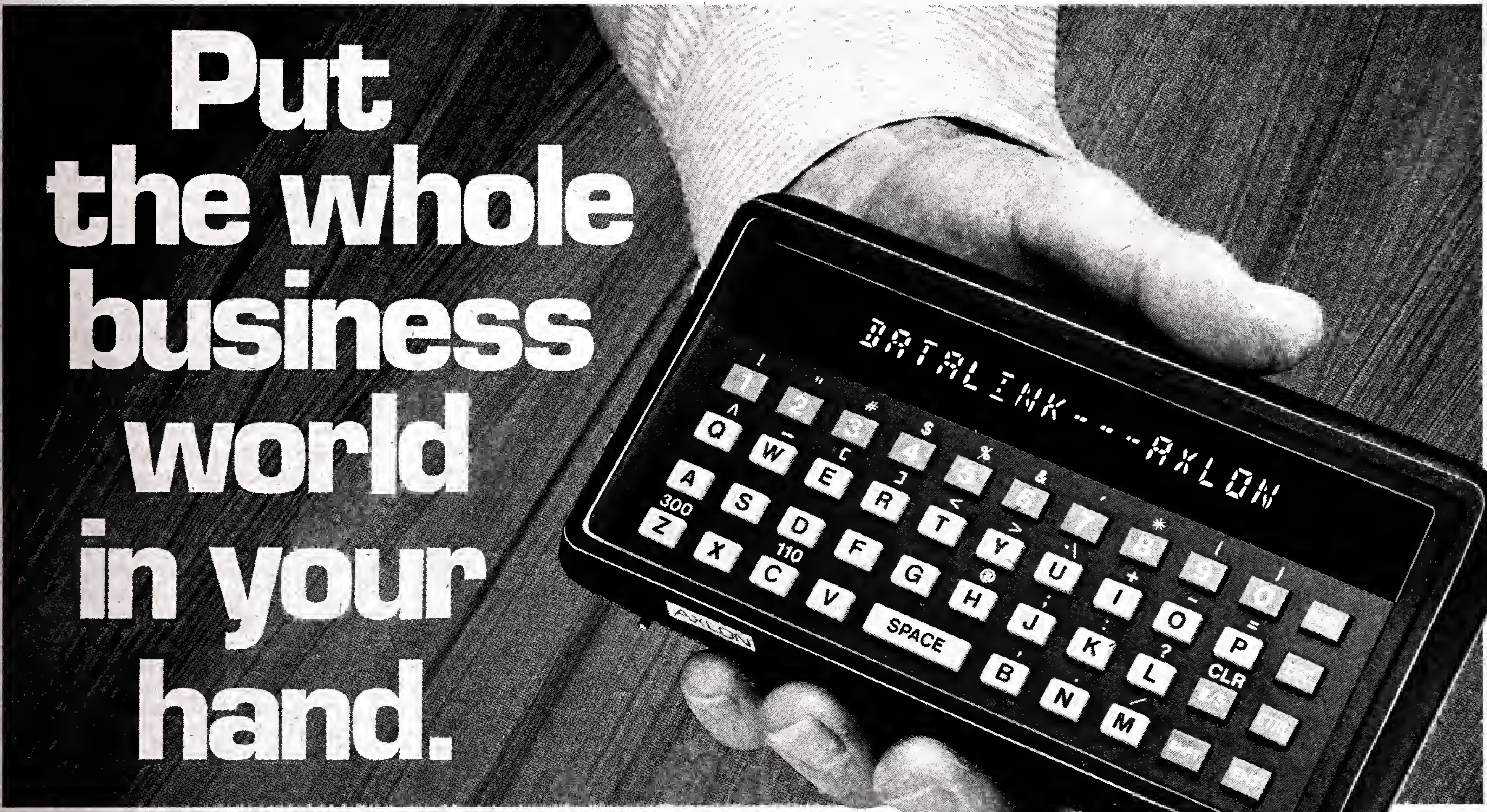

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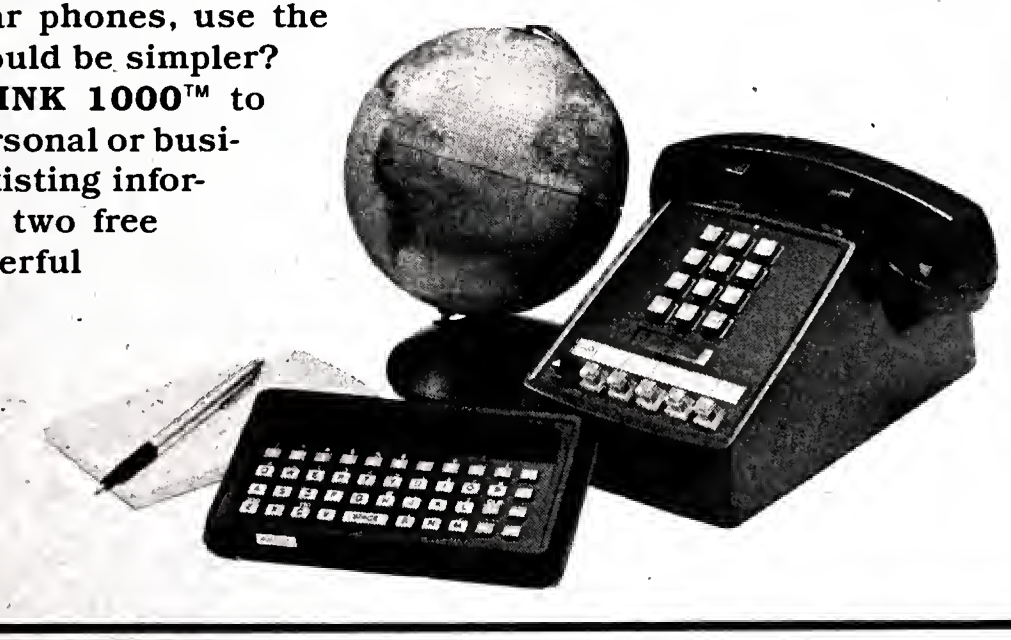

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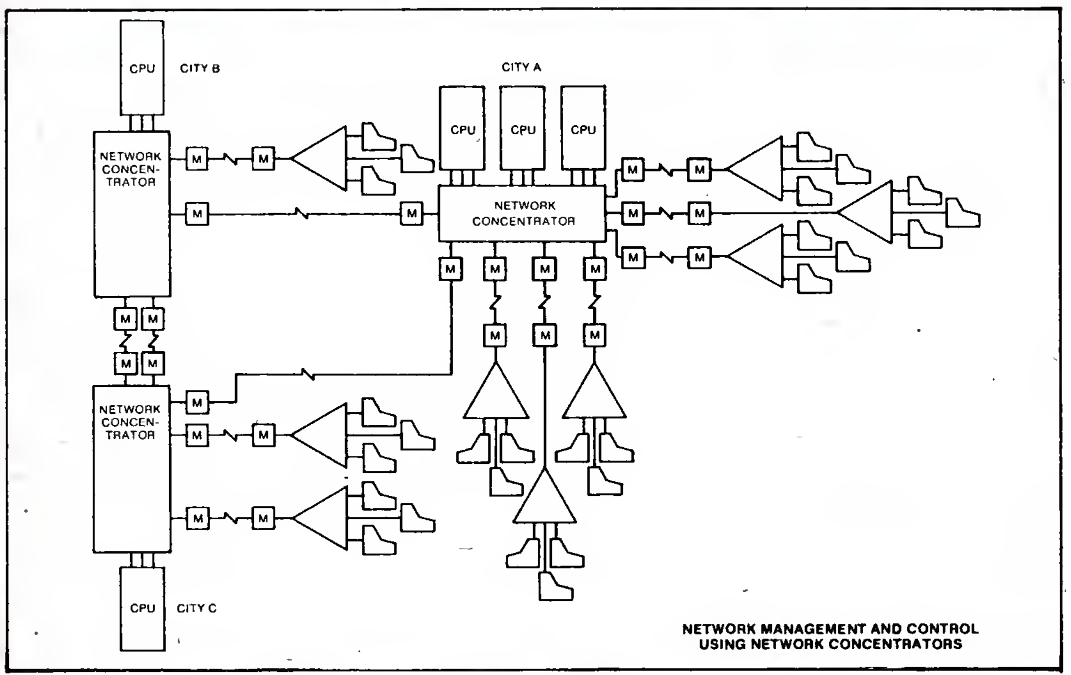


Figure 1

Net Concentrators Monitor Traffic, Control Downtime

(Continued from SR/14)

tistical multiplexers is that although they offer users the highest degree of network operating economy, they increase the risk of serious problems in case of channel or device malfunction.

Additionally, because major networks are extensive, downtime on any one leg can seriously impair the functionings of an entire organization. A typical example might be the vast electronic funds transfer systems that are now vital to the existence of modern banking or the operations of a multinational manufacturer.

Modern statistical multiplexing, with the introduction of sophisticated data communications equipment such as the network concentrator, is now able to attack and control the bugaboo of network downtime. As with any complex organism, from the human body to an elevator system in a modern skyscraper, the whole secret is diagnostics — checking for symptoms that trouble is brewing.

High Speeds

Modern networks handle such high volumes of traffic at such high speeds that the red and green diagnostic lights that can be found on almost all individual elements in a network, down to the most modest modem, are not really of much help in this diagnostic process. Network dynamics today are such that by the time a remote operator notices a red light glowing on some panel, the fact is already in the fire.

It is here that the user can have protection through the new generation of data communications equipment — network concentrators. The concentrators are sited at the key gateways of the network.

They are part of each CPU front end and are at the prime nodal points of remote clusters. Through them, any device within the network has the capability to communicate with any other device (see Figure 1).

This interdevice communications function, as well as the fact of the movement of all traffic through the concentrators, gives the user a number of advantages. For one thing, the units are able to monitor constantly device performance and line performance.

They are also able to monitor and record traffic volume, error rates, events and other historical data, including the utilization of buffers and the lengths of queues in real time. All these capabilities protect against network failure.

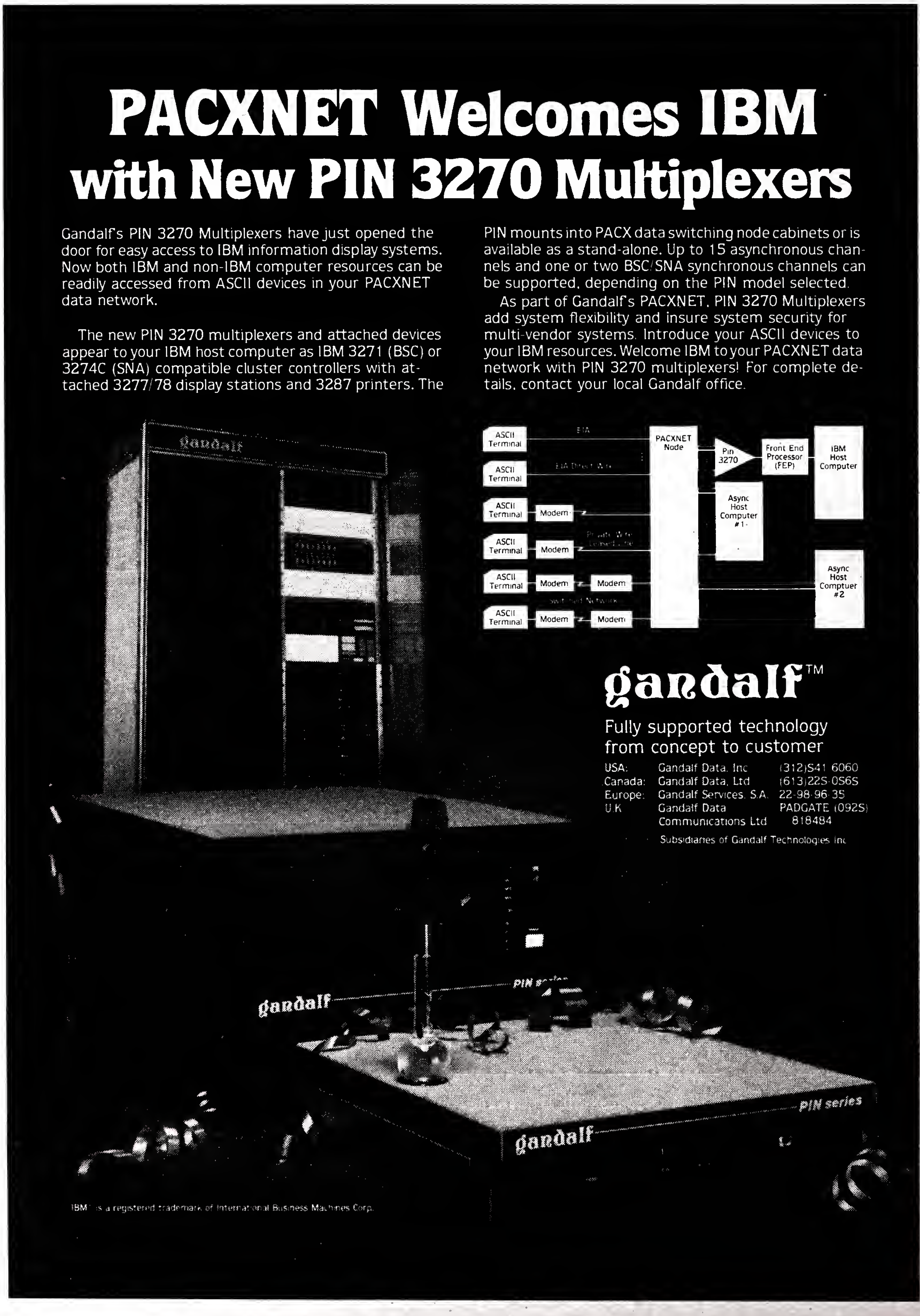
The Next Logical Step

Armed with these capabilities, plus strategical siting, the next logical step has been taken with the assignment of the responsibility for monitoring to network concentrators and providing them with the ability to take remedial action.

A data communications vendor with vision bases its design for a concentrator that both monitors and acts on one key assumption: Changes in the modern network environment occur so rapidly that human intervention is just not adequate.

This modern approach to network failure meets requirements for the user with a console system. The concentrator system configuration includes a CRT display of the network with graphics and a menu display of all network paths as well as detailed network segment displays down to the most remote network element.

Barnes is senior product manager with Infotron Systems Corp., Cherry Hill, N.J.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Hospital Finds Cure With Self-Developed Net

By Bill W. Mathis
and Mary Elise Biergert
Special to CW‡

LOUISVILLE, Ky. — How does an organization begin to build a private information network from scratch?

High technology has presented so many options that the task of bringing these diverse elements together in a cohesive, workable system may seem overwhelming. The genetics of network building are such that elements can be combined into any number of hybrid blends, of which no two may be exactly alike for any two organizations.

Going the route of commercially available networks does not necessarily make the choice any easier. Even among these predeveloped systems, the multiplicity of functions offered is staggering. An absence of established, industrywide standards in network technological development further complicates the selection.

However, an effective network can be self-developed. It takes a set of clearly formulated objectives, a thorough familiarity with a wide range of available technology and a flexible, phased approach to the entire process. Competence in managing high technology and a proper mix of technical staff expertise are also definite musts.

The first and most critical phase of network development is in determining and defining the organizational objectives that the network is intended to accomplish. Networks can be doomed to failure from the start before the first hardware is ever in place if objectives have not been well thought-out.

Another related pitfall in network design is placing an overemphasis on technology while underemphasizing objectives. Both are imperative, but failure to give objectives primary consideration can result in a white-elephant network in which technology is badly mismatched to original intents.

Once appropriate, attainable objectives have been formulated, they can be spelled out in design elements to serve as basic blueprints of network architecture.

Network construction — assembling the building blocks of hardware, software and communication links — should follow logically from stated objectives and a detailed master plan into a configuration that uniquely addresses the organization's needs.

A few network prototypes are being developed in the health care industry, utilizing fully integrated clinical data bases in geographically distributed network configurations.

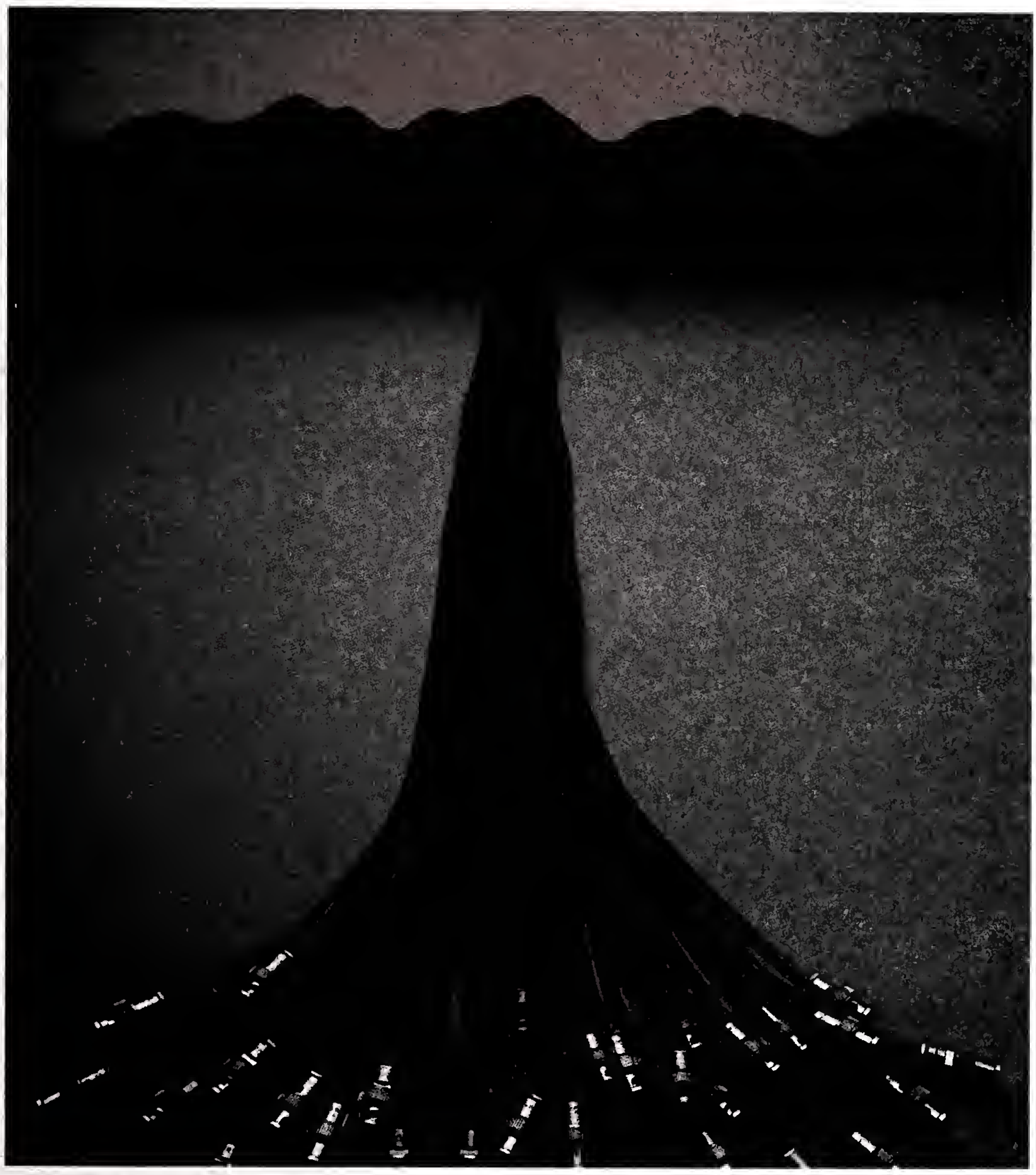
One successful network of this type is Health Data Network (HDN), established in 1970 by Baptist Hospitals, Inc. as its agent for developing a multihospital system of shared data processing services.

From central computer facilities in Louisville, Ky., HDN extends services across 500 miles to five hospitals and several physician practices in widespread locations.

HDN provides a completely self-developed, on-line, real-time health care information network, integrated for use by hospital administrative staffs, nursing personnel and most ancillary departments. It is also used by physicians from their offices and within the hospitals.

Currently, the network is interfaced with Blue Cross/Blue Shield of Kentucky for filing insurance claims and is interfaced with an automated bank clearinghouse for direct deposit of hospital em-

(Continued on SR/20)



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Installation is easy, using existing RG-62A/U coaxial cable and BNC connectors. It's especially easy when you consider the alternative—pulling miles of new cable through already-crowded ducts.

Up to four cables can be run from the CMX, so you can support 3278, 3279 and 3287 devices on different floors, or in different directions, from one unit.

The CMX Cable Multiplexer system is available in 32-port, 24-port, 16-port and 8-port models. It is completely transparent to IBM user software and terminal operation and meets all type A interface and cabling specifications.

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Ungermann-Bass

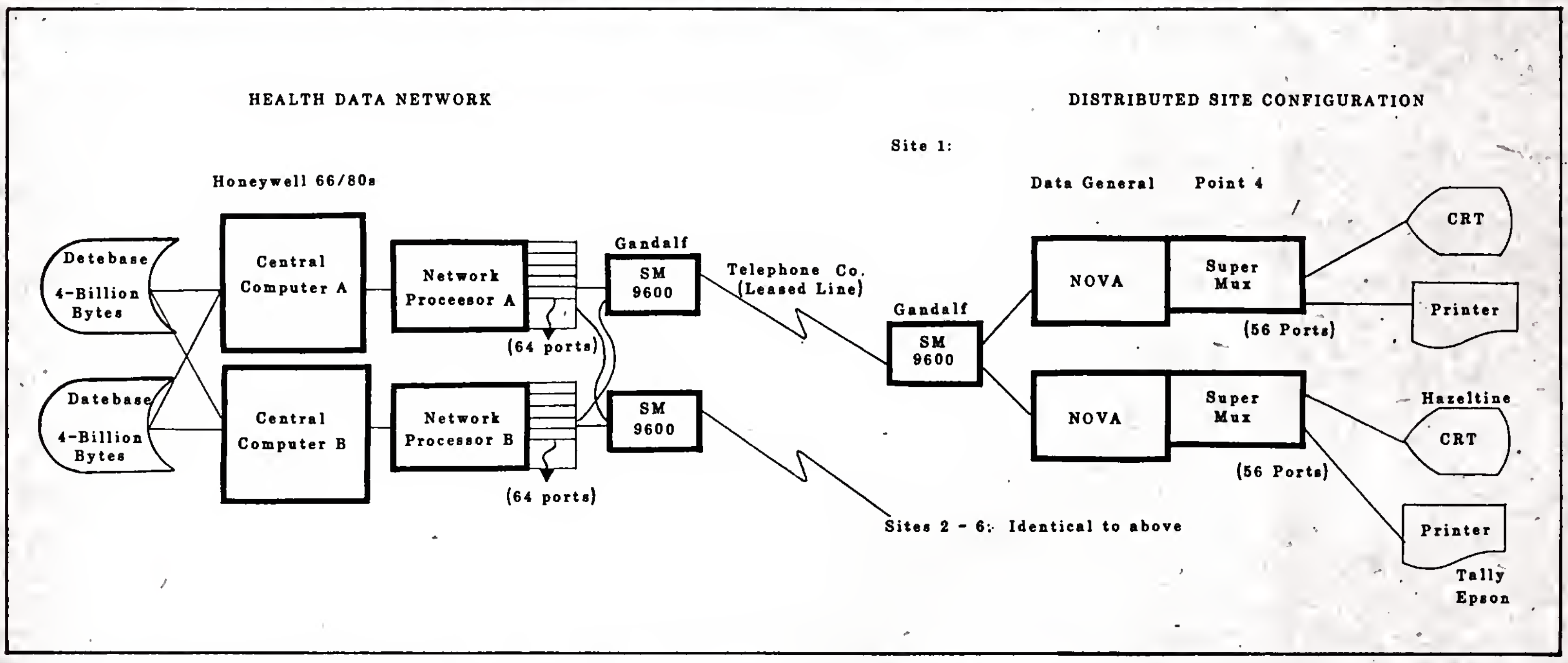

Diagram above depicts distributed site consisting of 12 Data General Corp. Nova systems located at six sites.

Hospital Builds Info Network From Scratch

(Continued from SR/19)

ployee paychecks.

The basic objective of HDN is to manage clinical and financial information resources to improve patient care. Three design premises form the core of the network:

- Information must be available to health care personnel wherever and whenever it is needed.
- Health care personnel must have control of and bear responsibility for information they process.
- The computer system must approximate what happens when it happens at all points in the network.

Because health care information demands a high uptime operation, HDN maintains its services 24-hours a day, seven days a week.

HDN chose not to rely on commercial software packages and instead has developed all of its software applications, based on extensive input from hospital department staffs.

Actively involving the end users in systems design has resulted in highly functional software. Hospital staffs are also encouraged to participate in system enhancement by submitting their suggestions for improvement.

Multivendor Approach

For maximum flexibility in hardware management, HDN takes a multivendor approach. It purchases equipment on an OEM basis after its in-house engineering staff has researched and evaluated products the market has to offer. Following this policy, the network can select state-of-the-art equipment that gives the most performance for the dollar.

The multivendor policy is reflected in the variety of network hardware. The central processing system consists of two Honeywell, Inc. 6680 systems. These systems have large-volume disk drives having 8G bytes of memory.

The CPU is actually tandem computers, hard-wired together to act as a single unit. Both mainframes are run by one master copy of the operating system.

The double advantage in such a redundant system is that each computer serves as a backup to its twin, and the work load can be shared between the two.

Network reliability is maintained by an uninterruptible power system, consisting of a diesel generator and battery pack. The power supply automatically drives the network if the utility company service fails. In addition, the engineering staff is on call around the clock for maintenance to the system.

For future development, HDN plans to replace all land-based channels with a single satellite channel by 1985. Voice and data transmissions by satellite are intended to increase both the reliability and the reach of the network.

Mathis is president of HDN in Louisville, Ky. Biegert is a staff writer at HDN.

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Will Offer Video, Voice Transmissions

AT&T's T-1 Digital Line Service a Boon to Users

By **Ed Botwinick**
Special to CW‡

What well-established communications facility is almost inaccessible to end users, yet is one of the most important factors supporting efforts to automate the office via digital networks?

The answer is T-1, AT&T's name for a digital communications line running at 1.544M bit/sec. To understand why, some background is needed to indicate how the present conditions are creating an opportunity for ultrawideband transmission.

In order to facilitate efficient switching and transmission within the telephone system, the analog voice signal from a standard telephone is generally digitized once it reaches the central office. Each voice channel requires 64K bit/sec of digital transmission bandwidth.

Within the telephone system, digitized voice channels are then multiplexed in groups of 24 requiring an aggregate 1.54M bit/sec of transmission bandwidth. This 1.54M-bit transmission link is known in the telephone world as a T-1 facility. Because so much equipment is available for telephonic use to run at that precise speed, it has also become a de facto standard for many satellite and digital radio transmission systems.

Until about two years ago, T-1 facilities were available only for internal use within the Bell system. When AT&T's Telpak service was discontinued, user demand and a court order made leased-line T-1 service available to subscribers.

T-1 Availability

However, T-1 is currently difficult to obtain under the traditional business philosophy of many telephone companies. Offering T-1 links directly to users is considered to be a cut-rate, wholesale service that reduces total revenues. Telephone company managers who are more in tune with data communications and future office needs have come to realize that the effect will be anything but that.

The availability of private-wire T-1 service will undoubtedly be the catalyst for the creation of a multitude of new uses for it. For example, video teleconferencing systems are now available that will allow high-quality video to be transmitted over a single T-1 facility. This compares with the four T-1s that were required for the now-defunct Picturephone service.

Newly developed signal processing technology shows promise of reducing this to 256K bit/sec or less without significant loss of picture quality. This means that private video teleconferencing links can share T-1 facilities with other applications, reducing the amount of travel required for conferences and meetings.

Similarly, high-speed digital facsimile systems are already on the market with the capability of transmitting a page of information in well under a minute on voice-grade lines. With minor modifications, many of these units could transmit at several times that speed if there were transmission facilities economically available to take advantage of those capabilities. But only the highest volume users can afford these facilities today. Economical T-1 service, however, would make this extremely cost-effective for a much wider user base.

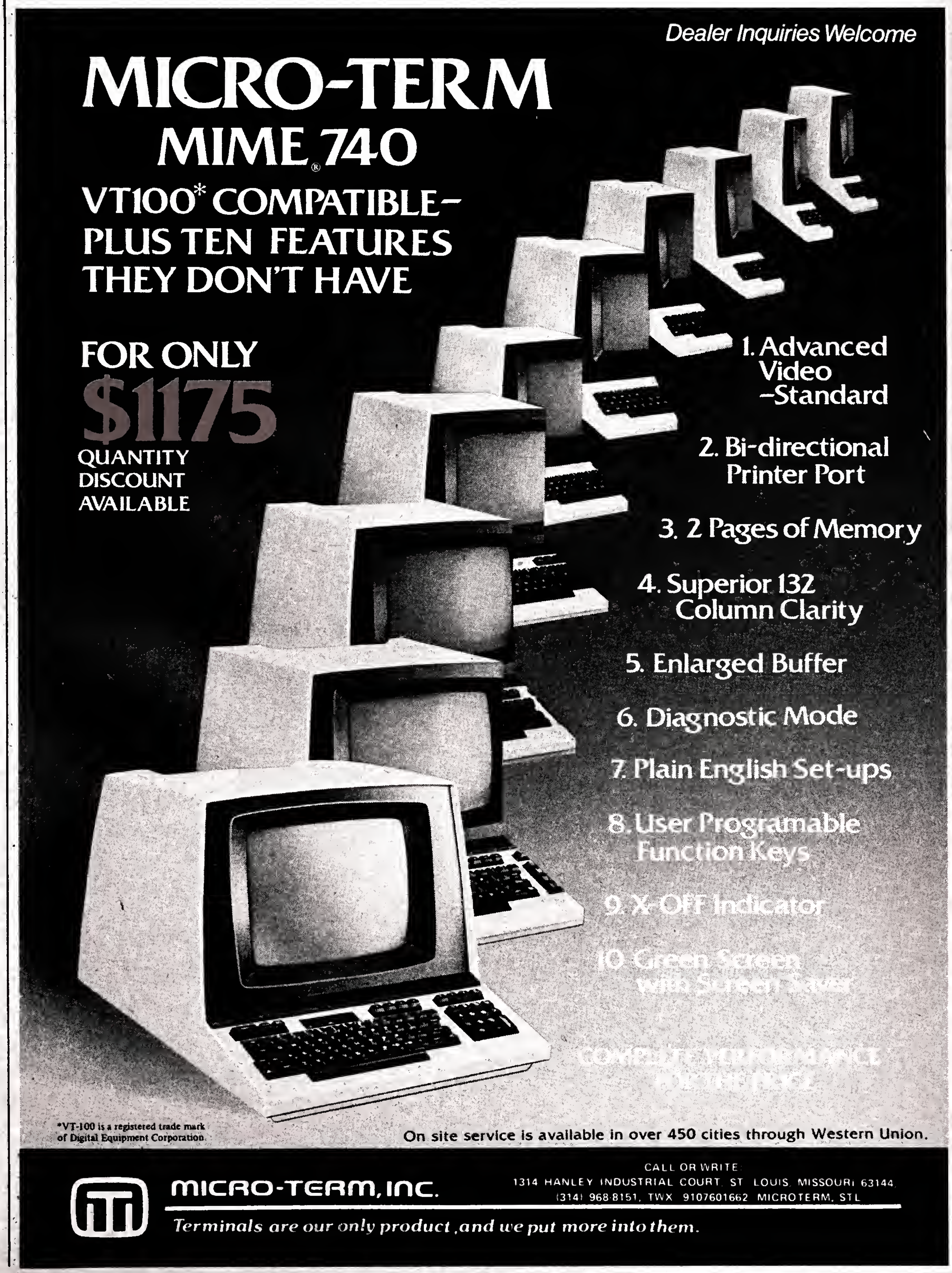
There are other uses for T-1 service. Most distributed data communications today operates over voice-grade lines (up to 14.4K bit/sec or Dataphone Digital Service rates up to 56K bit/sec). Increasingly, there are needs for even higher speed computer-to-computer links. These may be used for consolidation and updating of data bases or for maintaining backup copies of programs and data at a remote location for use in case of a major power or equipment failure or some other crippling catastrophe.

Until the availability of T-1 service, this was feasible only for the largest users who had access to private satellite links and, even then, could be effective only between those locations that had earth stations. Because T-1 will soon be widely available, however, small- and medium-size users can begin to think in terms of ultrawideband facilities.

Far from causing the phone companies to provide wholesale discounts, T-1 should be an extremely profitable new service. Because T-1 is inherently a low-cost entity, it can bring many new users and applications onto the network.

The reason for this is simple. Much of the existing copper telephone wire installed today can be inexpensively upgraded from voice grade to T-1, through the installation

(Continued on SR/24)



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DISTRIBUTED PROCESSING NETWORKS

Another in a series of messages on advanced technologies from Honeywell Information Systems.

Many data processing professionals are being faced with demands for networks capable of moving increasing amounts of data among more and more locations. Up to now, application-dependent network structures—with their inherent risk of major conversions—offered the most readily available response. Honeywell's Distributed Systems Architecture (DSA), however, provides a more practical alternative. An application-independent networking structure, it fully supports public, value-added, private and international nets.

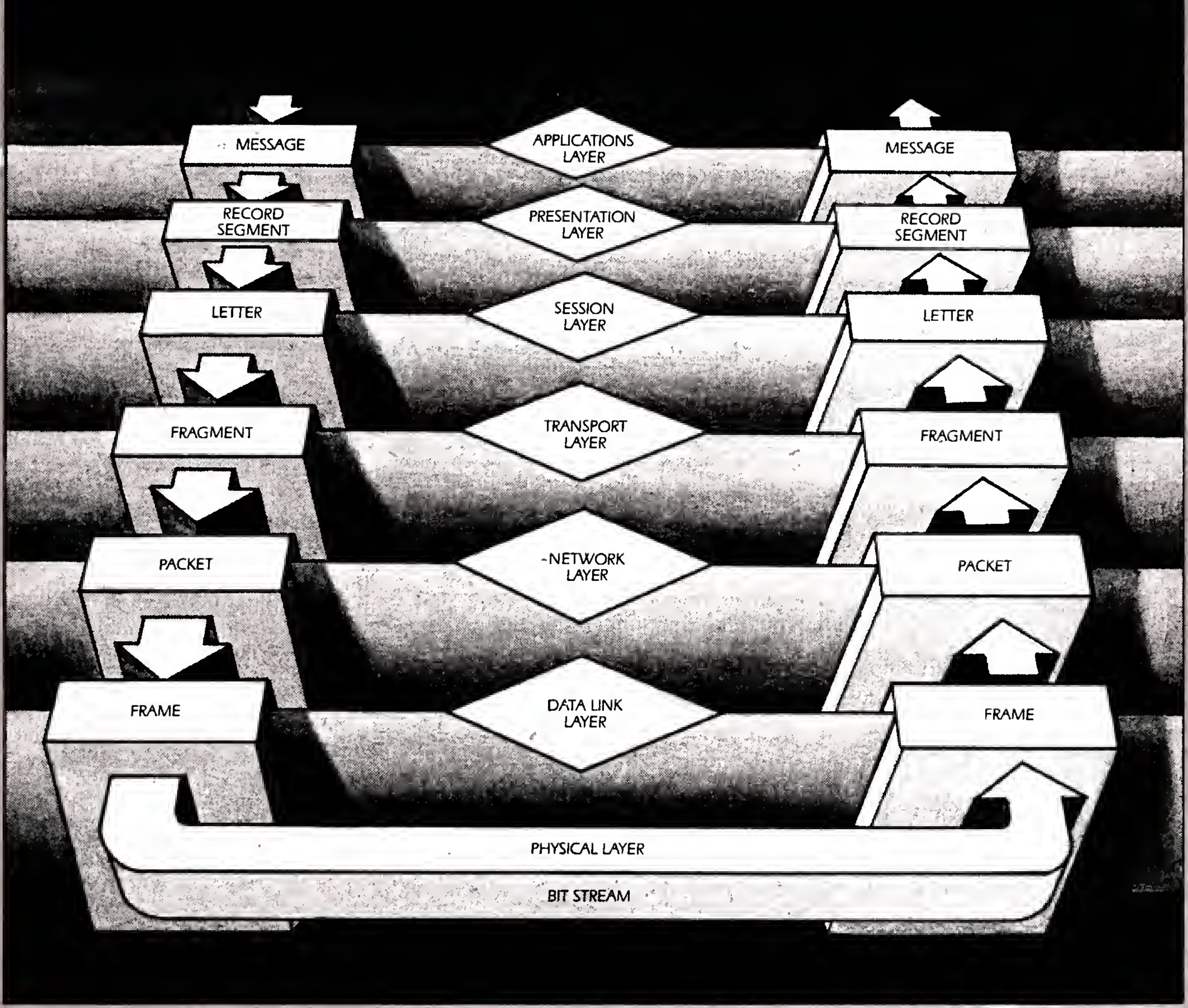
World-Class Networking Today
Honeywell's DSA establishes standards for data movement and application cooperation in compliance with the International Standards Organization's (ISO) open systems reference model. The architecture, which is not dependent on specific technology or techniques, keeps applications and communication processes separate. Thus DSA is transparent to the end user. DSA creates a cooperative, flexible environment within which the user can build and phase in a communications system that can handle current applications and grow to meet new domestic and international demands.

DSA Structure
DSA's flexible set of rules, protocols, and interfaces allows users to configure and implement data processing systems and networks to help meet the needs of geographically dispersed organizations. Introduced in 1980, DSA consists of a seven layer architecture divided into three groups. The implementation of the first four layers in the Communications Management group controls physical exchanges across the network. The next two layers, the Message Management group, format messages so that the communicating entities can understand each other. They also contain the dialog mechanism that permits communicating activities to synchronize their actions, and the presentation control services which provide application independence from data format, character codes, and terminal handling conventions. The seventh layer, Applications, defines the logical rules to which computer applications conform when communicating. Finally, each layer of DSA also provides network administration and control data to enable overall network control of the distributed system.

Network Support
Because DSA conforms to the ISO open systems model, it's certified as providing native support for the CCITT international X.25 packet-switched and X.21 circuit-switched network protocols. These protocols are being implemented in a growing list of public data networks around the world as well as in value-added and private networks. DSA products support such X.25 based networks as TELENET and TYMNET (United States), DATAPAC (Canada), DATEX-P (Germany, Austria), DDX-P (Japan), DN 1 (The Netherlands), EURONET (European Economic Community), PSS (United Kingdom), EDWP (Switzerland), and TRANSPAC (France). Also supported is the X.21-based NORDIC Net (Scandinavia, Finland). DSA uses High-level Data Link Control (HDLC), also an ISO standard, for data communications between intelligent devices in private networks. Users can configure hierarchical, peer-coupled and hybrid network topologies.

Product Implementation

DSA already enables medium-scale and large-scale host computers and mini-computers to operate in a variety of network configurations. Specialized network processors can be utilized for front-end processing, remote concentration and switching, in addition to communications control and administrative functions. The implementation includes such distributed processing applications as file transfer, remote job entry, terminal concentration and two-level transaction processing as well as office automation applications, including document distribution and host storage, and printing of documents. In addition, DSA administration permits monitoring, control, and maintenance of the network from one or more control sites.



DSA consists of seven layers of functions and protocols governing data handling among network nodes. DSA's implementation of the bottom four layers makes physical exchanges across the network transparent to the end user.

SECONDARY NETWORK

SECONDARY NETWORK

Future Growth

DSA is an important part of Honeywell's implementation of its Distributed Systems Environment (DSE). Future DSA developments will support fully-distributed transaction processing with system-supplied coordination, control, and recovery, load leveling, and resource sharing across computers. This type of peer network will allow host and satellite processors to cooperate as full equals in distributed systems. The open architecture will be further enhanced to meet evolving international network standards while protecting investments in systems already installed. Additionally, data bases will be partitioned across multiple processors with automatic access and updates at all locations. Thus DSA is part of an evolution to fully distributed systems with globally accessible resources.

More on Distributed Processing Networks

For an in-depth description of the DSA open architecture call our toll free number, 800-343-6294 (in Massachusetts call 617-552-2264) or write Honeywell, 200 Smith Street (MS 487), Waltham, Massachusetts 02154.

SECONDARY NETWORK

PRIMARY NETWORK

Honeywell

Overall Plan Needed for Corporatewide Nets

By Tom Rizzo
Special to CW‡

Today's managers of information systems and their associates in information supervision, telecommunications managers, must try to formulate an overall plan for information handling within the corporate environment.

Obviously, the all-inclusive network to be developed must deal with analog voice, digital data, keyboard-generated text, software-enhanced graphics, freeze-frame and continuous video as well as hard-copy image or facsimile. The aim here is to provide conduits or processes for applications development, not just a proliferation of electronic, feature-laden gadgets.

These processes or categories can be manipulated presently via several technologies that will form the nucleus of the integrated systems that are rapidly taking form. These prime technologies include the voice/data private branch exchange (PBX); local-area networks; electronic message and document distribution, both voice and hard copy; and executive workstations and teleconferencing.

With a knowledge of the technologies to be investigated, the next step appears to be the choice of the initial system to be put in place or the cornerstone to be laid.

Arriving at this point, most managers will immediately realize that they need more than one type of network due to current technological availabilities and constraints as well as different applications demands.

Because at least 80% of all communications still appears to be voice rather than data, the selection of an integrated voice/data PBX will be the initial thrust or first step into the contemplated integrated systems network plan for the corporation. This is because it provides solutions to both verbal and digital corporate communications needs.

But other than voice, why should the integrated office controller or focal point of the network be an integrated voice/data PBX? Consider the following mitigating factors: the almost universal availability of two-twisted-pair wiring in existing buildings, the familiarity of present-day office workers with telephone-type equipment and the already-developed expertise of telephone technicians to service installation.

Also important is the flexibility in reference to distance that can be accommodated by devices using two-twisted-pair wiring, the large number of different devices that can be connected, the multifaceted communications interfaces to other common carriers and value-added networks

(Continued on SR/26)

AT&T's T-1 Line Benefits Users

(Continued from SR/21)

of low-cost repeaters every mile. The phone company can then rent or lease this facility at a sufficiently high multiple of the voice-grade rate, perhaps four to eight times. This would provide a very fast return of the cost of upgrading the line to T-1 at a much greater profit to the operating company thereafter.

The user, on the other hand, considers that he is getting a bargain, with the equivalent of 24 voice-grade lines at a fraction of the equivalent cost. The new applications that will undoubtedly arise to fill this bandwidth are examples of the pervasiveness of commercial technology and the significant elasticity of markets under the influence of technology-driven cost and price reductions.

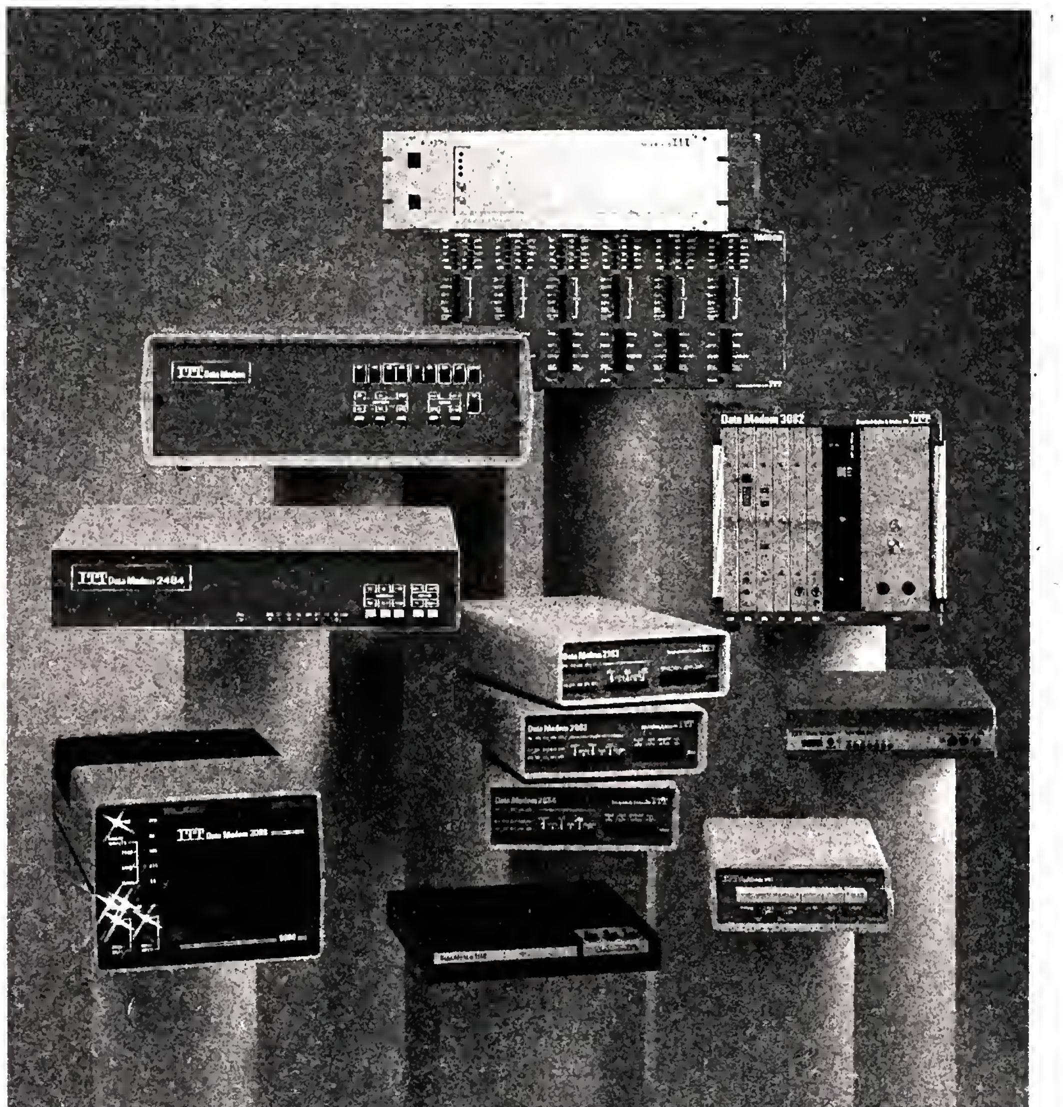
T-1 service can be obtained as a specially engineered facility in many parts of the country. Many telephone operating companies are beginning to realize the opportunities offered to them by providing tariffed T-1 service. Several are now in the planning stages for a formal offering.

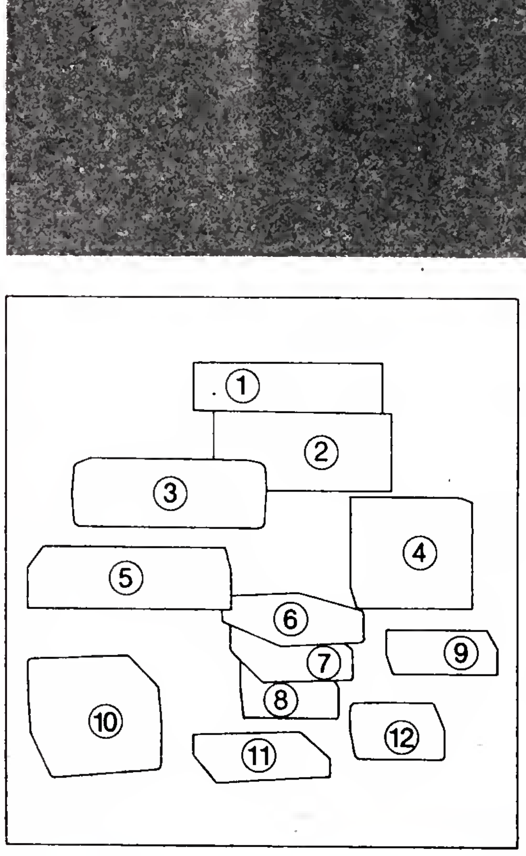
Managing T-1

When T-1 service is readily available, users will require an electronic management system to divide the T-1 bandwidth into speeds that are compatible with normal data processing uses and to manage effectively that facility by switching portions of it between wideband uses that do not need to operate all the time.

To solve that emerging need, Timeplex, Inc. has been developing Link/1, a family of T-1 Facilities Management Systems that will enable a large cross-section of users to begin to realize the true promise of future office services, economies and conveniences. They may then also take advantage of capabilities that are already available for computer communications, but have previously been too costly for the average user.

Botwinick is president of Timeplex, Inc. of Rochelle Park, N.J.





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Improve Performance, Cut Costs

Monitoring Systems Aid Network Managers

By Tim Ahlstrom
Special to CW‡

American business has invested billions to establish and run data communications networks linking far-flung sites and providing immediate access to central data bases and computing power. Staggering sums have been spent because data communications has become essential to business operations.

Banks authorize and record credit-card purchases and offer 24-hour services through automatic teller machines. Insurance companies process premiums and handle claims from agents' offices. Engineers design cars. Travel agents book passengers, assign seats and write tickets. Shippers track freight. Retailers manage inventories at warehouses and process updates from point-of-sale terminals. The list is endless — users and computers are tied together by expensive networks.

Typical costs average $1,000/mo or more for each line and $1,500/mo for each terminal and operator. Thus, an average 100-line, 1,200-terminal network costs nearly $2 million in monthly network expenses.

Data communications networks were set up because corporate managers realized that information is a fundamental corporate resource. So, while the network is a necessity, it is an expensive one.

Now, after a decade of expanding networks, after years of meeting other peoples' information needs, network managers are defining their own needs for information. Operating, managing, improving and growing an expensive corporation network requires information. Network performance monitoring and management systems, such as Avant-Garde Computing, Inc.'s Net/Alert, can provide much of the necessary information.

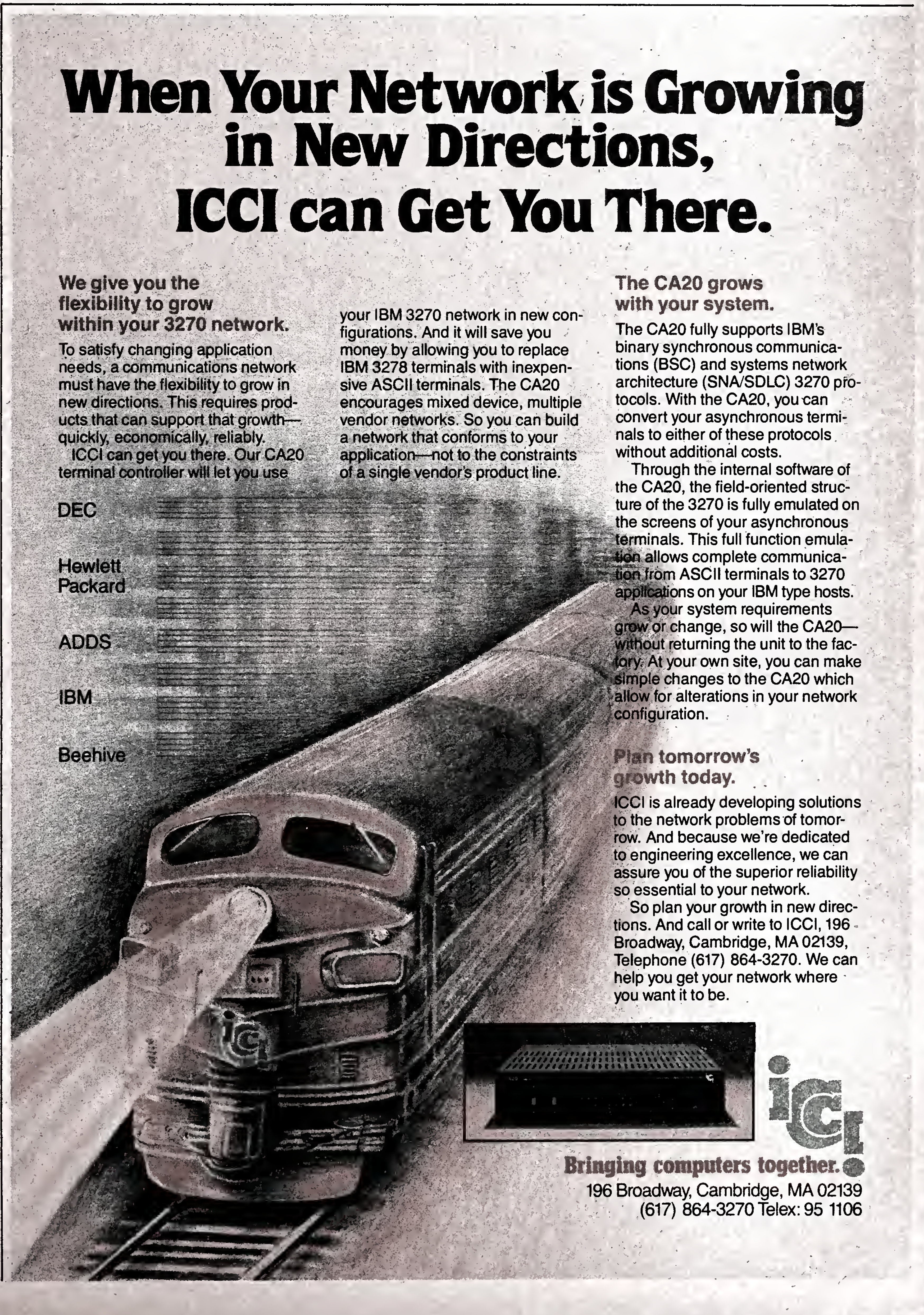
Operationally, network managers need information that describes status, performance and utilization, defining service levels and availability to users. Critical status and performance indicators include response times, traffic volumes, error rates, time-outs, no-polls, equipment and facility failures (see figure on SR/28).

Network staff need these indicators in real time so problems can be identified quickly by early warning of service degradation or overload. They need the information for the highest level of aggregation — the network — to the lowest level of detail — the terminal — with all levels in between — lines and regional groupings, for example.

Users view network performance as good response-time and on-demand availability. As a result, managers need response-time statistics for each device, line and line group as well as for the network as a whole. Response-time statistics for various types of applications or transactions make it possible to see not only how well the network is working, but also how well it works for a specific task.

This type of performance information allows network managers to set, evaluate and meet service objectives, validate service contracts, audit service charges and define precisely the impact of various applications on the network and the host. Perhaps most importantly, it enables

(Continued on SR/28)



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Overall Plan Necessary to Corporate Networks

(Continued from SR/24)

and the data switching capabilities.

Admittedly, these are only some of the benefits that such an approach would provide.

But to make sure that these advantages become a reality and do not remain vague marketing promises, it must be certain that the integrated systems controller or PBX to be installed offers the following upon installation:

- Simultaneous integration of both voice and data, based on an integrated systems design as its chief goal.
- Networking or interface capability to other systems already in place or to be added in the future.
- Capability to integrate multiple devices supplied by multiple computer, telecommunications and office equipment vendors.
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- Electronic equipment that can handle not only voice features, but also data applications.
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But what about video, high-speed data transmission beyond 56K bit/sec, connection of personal computers and other data-handling capabilities?

Why not implement these solutions as individual or separate building blocks within the total systems architecture of the corporation as needed?

Future Interfaces

At least with an installed digital voice/data PBX with intrinsic integrated systems design capabilities, there is the distinct possibility that future interfaces will be developed to interconnect the systems and bring in these other networks when and if it is desirable to do so in the future.

In reality, then, the integrated voice/data PBX, if used as the fulcrum for systems integration or as an integrated office controller, will not preclude or diminish the specific technical advantages of other local-area-type networks.

In all probability, the launch into the future should come through the integrated voice/data PBX. This first step should not be initiated without a total corporate strategy. This plan should include input from all disciplines, telecommunications, data processing and office automation/integration, regardless of their political positions within the corporate pecking order.

The integrated voice/data PBX certainly is not more or less appropriate than a local-area network with a coaxial cable in order to harness the energy of the present-day communications explosion. It just makes good business sense to use the all-pervasive phone network already in place for functions other than voice communications, because this is an idea whose time has definitely come.

Rizzo is the chief executive officer of the consulting firm RFC Systems Integration of Dallas.

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Keeps Tabs on Sweet Sales

Portable Terminals Scout Council's Cookies

DAYTON, Ohio — Girl Scout cookies are big business — especially when it comes to keeping track of how many are sold and by whom. That task is the responsibility of the local Girl Scout council — one of many challenges to a council's accounting and record-keeping abilities.

Like many other councils around the country, the Buckeye Trails Council has turned to computer technology to control inventory, process information and streamline record keeping. Using portable data terminals and a small business computer system from Texas Instruments, Inc., the council manages both the annual cookie sale and its day-to-day financial operation more efficiently.

The Buckeye Trails Council, located here, keeps track of cookie sales for the 1,200 troops in a seven-county area. Last year, that meant keeping tabs on 1.1 million packages of cookies.

The council stores all the information about the cookie sale in a host computer at the University of Dayton and has selected a TI Silent 700 Model 745 Portable Data Terminal to communicate with the computer. This allows council members to keep accurate, current information available to troop leaders and council professionals as the annual four-month sale progresses.

"In the past, a scouting volunteer kept records for our cookie sales with a manual accounting system," said Ed Desorcy, assistant executive director for financial services of the Buckeye Trails Council. "This was adequate when we began the sales with a volume of 400,000 to 500,000 packages of cookies, but then we started to expand and needed help processing the information. With the TI data terminals, council bookkeepers now have a well-refined and efficient system for managing the annual sales."

The bookkeeper enters data on each troop into the data terminal and transmits it over the telephone lines to the host computer in Dayton. The standard information sent includes the name of the troop, identified by Girl Scout neighborhood and troop number; the number of members selling cookies; and the number of cookies received by the troop.

Then, as a troop gets additional shipments of cookies and deposits the sales receipts, reports are sent to council headquarters and updated via the terminal. The bookkeeper requests daily printouts itemizing the number of cookies each troop has taken to sell and their actual sales in dollar amounts.

To communicate with the host computer, the bookkeeper simply plugs the terminal into an electrical outlet, places a standard telephone receiver into the terminal's acoustic coupler and dials up the host computer. The daily printout is produced by the portable terminal's thermal printer.

"Our task is complicated by the fact that troops can swap cookies with each other, and they can also receive cookies from various 'cupboards' in their areas," Desorcy said. "The TI data terminal enables us to constantly update our records to reflect all the transactions. When the year's sale is over, we know whether

(Continued on SR/30)

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Monitoring Systems Help Managers Slash Net Costs

(Continued from SR/25)

managers to improve performance by telling them what the network is doing, when and how often, how well it is doing it and what the operating problems are. By showing them where they are, it helps them begin to get where they want to be.

Cutting Costs

But improving performance is only part of the network manager's job. Controlling — or cutting — costs is next.

Lines average about $1,000/mo, yet the average network has about 10% more lines than it needs. At the same time, it has saturated lines creating bottlenecks. Under-used lines could carry more of the load. Lines can be combined or eliminated, routes and traffic redistributed and dollars saved, but only with good information about line utilization.

Terminals and operators cost about $1,500/mo. Are there too many or too few? Are they located correctly? Are they where the traffic is? How does a manager know? Again, basic utilization information is needed so that under- and over-used terminals can be identified and shifted around and new terminals won't have to be added merely because a user says the current ones are swamped. Thus, money can be saved.

In addition to improving services and cutting costs, a manager also has to plan for the future; planning must be based on solid, useable information about current and historical use and performance, trends, unmet needs and excess capacity. This information will help keep services reliable, responsive and cost-effective as the network grows and as more sites and applications are added.

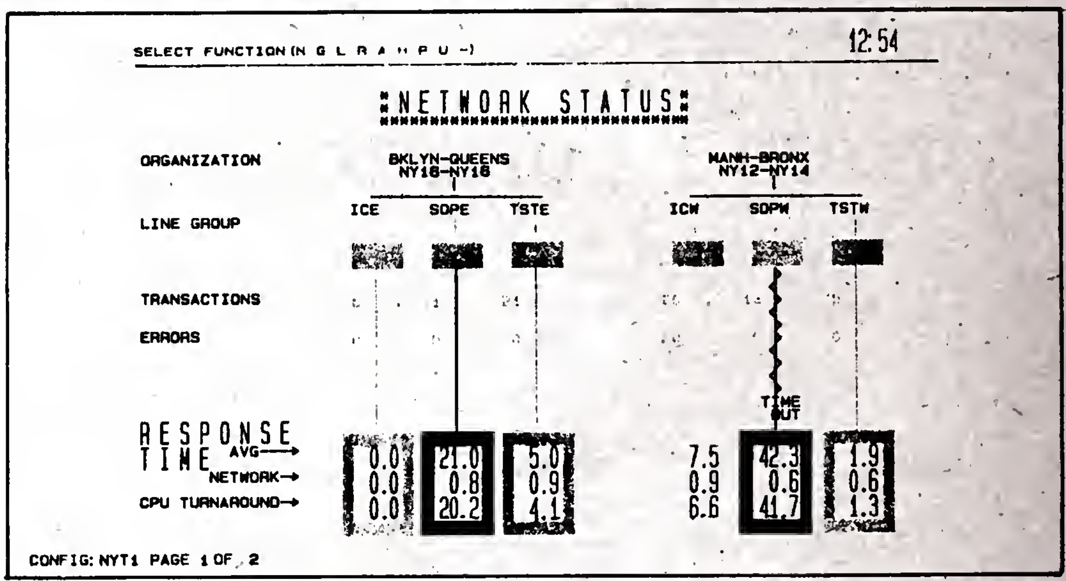
Application monitoring can play a special role in both evaluating services and planning improvements. Basic performance indicators show how well the network is working. Application monitoring shows how well the network handles each separate application, how each application affects response time or how it ties up the mainframe. It also provides detailed productivity analysis of each workstation by showing exactly how much of each type of work has been done at each station.

Data communications management in today's distributed processing environment is fast outpacing traditional concepts focused on technical control, line scoping, hardware troubleshooting and responding to escalating user service demands by adding more gear and new lines.

To meet the twin demands of improving services and controlling costs, today's network manager requires a web of useable information showing operational status and performance, historical performance and use, allowing him to identify and project trends confidently. That information can now be captured, stored and manipulated with existing and emerging technologies. It can be displayed in traditional tables and reports and in advanced color graphics. Most importantly, it can be made easily available to the network manager so he can do the jobs that are expected of him.

The task of network management is to deploy resources most effectively to achieve satisfactory performance and availability of services at affordable costs. An independent network monitoring and management system, such as Net/Alert, can assist by providing the information required.

Ahlstrom is president of Avant-Garde Computing, Inc. of Cherry Hill, N.J.



Operations status information is presented by Net/Alert in real-time, color-coded dynamic graphics. Performance thresholds are user set for major indicators. Information is summarized at network level, detailed for individual lines or aggregated at intermediate levels.

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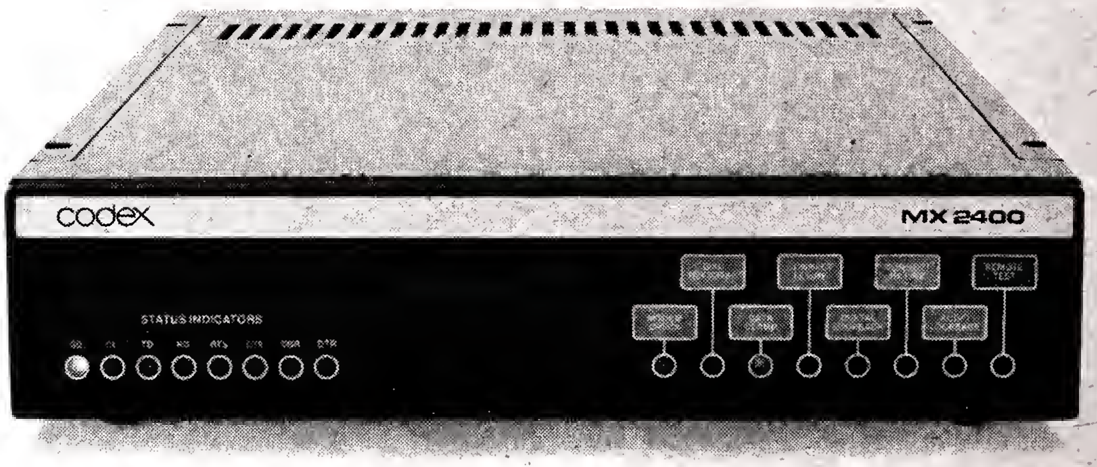

Bridge Micros, CPUs, Peripherals

Interface Units Extend System Capabilities

By David Misunas
Special to CW‡

Much attention has been paid recently to the use of protocol converters as terminal interface units, replacing IBM 3270 controllers and allowing the connection of asynchronous Ascii terminals or personal computers to an IBM-type host with full 3270 functionality. Many manufacturers, ranging from small start-up operations to IBM itself, have announced product offerings to perform this function.

The attractiveness of such terminal interface units lies both in the cost savings permitted by their use and the extended capabilities realized in the mixed-vendor, multifunction network. Perhaps the most exciting aspect of such extended functionality is that allowed by the combination of a personal computer and a terminal interface unit. Through such a combination, a user can perform required local processing and, when necessary, connect to the host system and interact as necessary with 3270 applications on that machine.

A typical example of an office with such a requirement is an insurance agency. The agency can perform many of the tasks and computations necessary for its operation locally on the personal computer and then interact on-line with the host to perform such tasks as policy generation and claim processing. The automation programs used in many insurance companies are beginning to exploit the protocol converter terminal interface units' technology in such a manner.

Contact with the host processor from an asynchronous terminal or personal computer connected to a terminal interface unit can be established in two ways. A small office may have only one or two personal computers or terminals and can dial a protocol converter at the host site with a low-cost asynchronous modem such as the Bell Laboratories 212 at 1,200 bit/sec, perhaps even using an inbound Wats line.

A larger office with many more terminals or personal computers and greater access requirements may have a protocol converter on-site with a leased line to the host. In this larger configuration, the user merely types a few characters on the keyboard to contact a host application.

A personal computer generally communicates with a terminal interface unit in the same manner as an asynchronous Ascii terminal. Thus, a mix of terminals and personal computers may be used on an individual terminal interface unit. Furthermore, a user station can be upgraded from a terminal to a personal computer merely by replacing the device connected to the terminal interface unit.

To perform such a 3270 emulation, a terminal interface unit must permit the asynchronous terminal or personal computer to support all functional characteristics of the emulated 3270 terminal. This involves not only the conversion of protocols from asynchronous Ascii to IBM Binary Snychronous Communication or Synchronous Data Link Control, but also the mapping of complex functional characteristics of the 3270 device into those of the specific asynchronous device.

Such a 3270 emulation is structured to require no modification of the host hardware or software for full compatibility. A user is able to disconnect the IBM terminal controller, connect the terminal interface unit, asynchronous terminals and personal computers and have full 3270 functionality.

The IBM 3270 family of devices operates in block mode. The host processor sends a block of data called a screen image to a 3270 terminal where it is viewed. Data entry or editing functions are performed locally at the terminal and the resultant screen image is transmitted to the host upon request of the user, usually after all local editing or data entry is completed.

To allow use of an asynchronous Ascii device in place of the 3270, a terminal interface unit performs all the functions of the block-mode 3270 device and maps those functions into the necessary mode of interaction with the asynchronous terminal. Thus, the terminal interface unit interprets all 3270 screen-formatting commands and orders to format the screen of an attached asynchronous device, providing the standard 3270 keyboard editing and data entry operations.

The keyboards of most asynchronous devices are only minimally compatible with the 3270 keyboard

(Continued on SR/30)

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Terminal Interface Units Increase Functionality

(Continued from SR/29)

structure and functionality. A 3270 keyboard has over two dozen single-key functions, whereas an asynchronous terminal may have only the alphanumeric keys plus a handful of functional keys.

For this reason, the terminal interface unit assigns keystroke sequences to the asynchronous keyboard to provide the 3270 functions. For example, to obtain a 3270 backtab function from the asynchronous keyboard, it may be necessary to type a sequence such as the Escape key followed by the Tab key.

To connect the personal computer to the terminal interface unit, the same mapping of Ascii character codes to 3270 functions is used, but much more flexibility is possible in the layout of the keyboard due to the programmability of the personal computer. For example, any key on the personal computer can be used to provide the 3270 Enter function merely by programming the personal computer to send the Ascii code for Return when that key is pressed.

Such changes to the keyboard mapping are at the discretion of the user; the personal computer can be used with the terminal interface unit directly without modification through use of a standard IBM 3101 display terminal emulation program within the personal computer.

Misunas is president of Industrial Computer Controls, Inc., Cambridge, Mass.

Girl Scouts' Cookie Sales Tracked by Data Terminals

(Continued from SR/27)

the troops owe us, we owe them, or we're even. And we also know that our information is accurate as we go along.

"The Buckeye Council Girl Scout sale is the largest in the state," Desorcy said. "Last year we had an 8% growth factor, with an average sale of 80 packages of cookies per Girl Scout. That's a lot of cookies and money to record accurately," he added.

"The entire staff, including troop leaders, relies on the printout as a source of up-to-date information on how the year's cookie sale is progressing. We've shown the complete program to other Girl Scout Councils and many are interested in acquiring it for their own cookie sales," Desorcy said.

The Buckeye Trails Council has also enlisted the help of a TI small-business computer system for managing daily record keeping, accounting chores and fund-raising activities.

"The Girl Scouts is a nonprofit organization, dependent upon grants and donations for our financial existence," Desorcy explained. "It is essential that we keep up-to-date records of our friends and supporters in order to maintain a healthy financial profile."

Before using the computer, the Buckeye Council fund-raising records were kept manually in individual card files. "Many times it took hours to zero in on specific donors," Desorcy continued. "In order to send a mailing to our friends interested in specific scouting projects, our staff had to review each card file and develop lists.

"With the computer all we have to do is enter the key information about each supporter into the computer, such as name and address, neighborhood, troop number, previous contributions and other special designations," Desorcy explained.

The computer can be used to arrange the information in a number of ways. For example, the operator can ask the computer for a list of contributors in a given neighborhood or for a list of total contributions earmarked for a specific project. A simple command provides a printed version of the newly arranged information on the system's printer.

"The TI computer allows us greater potential for using our information," Desorcy said. "We don't have the resources to sort and catalog the files manually.

"Now an unlimited amount of information is at our fingertips. For example, we like to send reminders and calendars to our contributors. Before we had a computer, keeping up with our supporters was a real chore. Now we don't forget anybody," Desorcy added.

"Managing our cookie sales efficiently and maintaining accurate records of our contributors are essential jobs for the Buckeye Council," Desorcy said.

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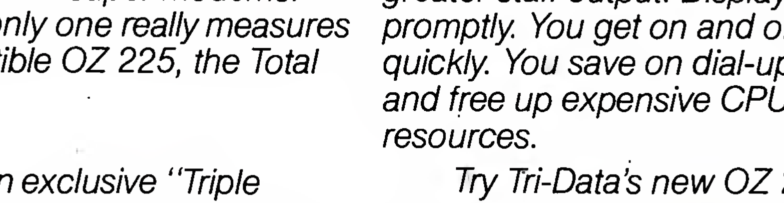

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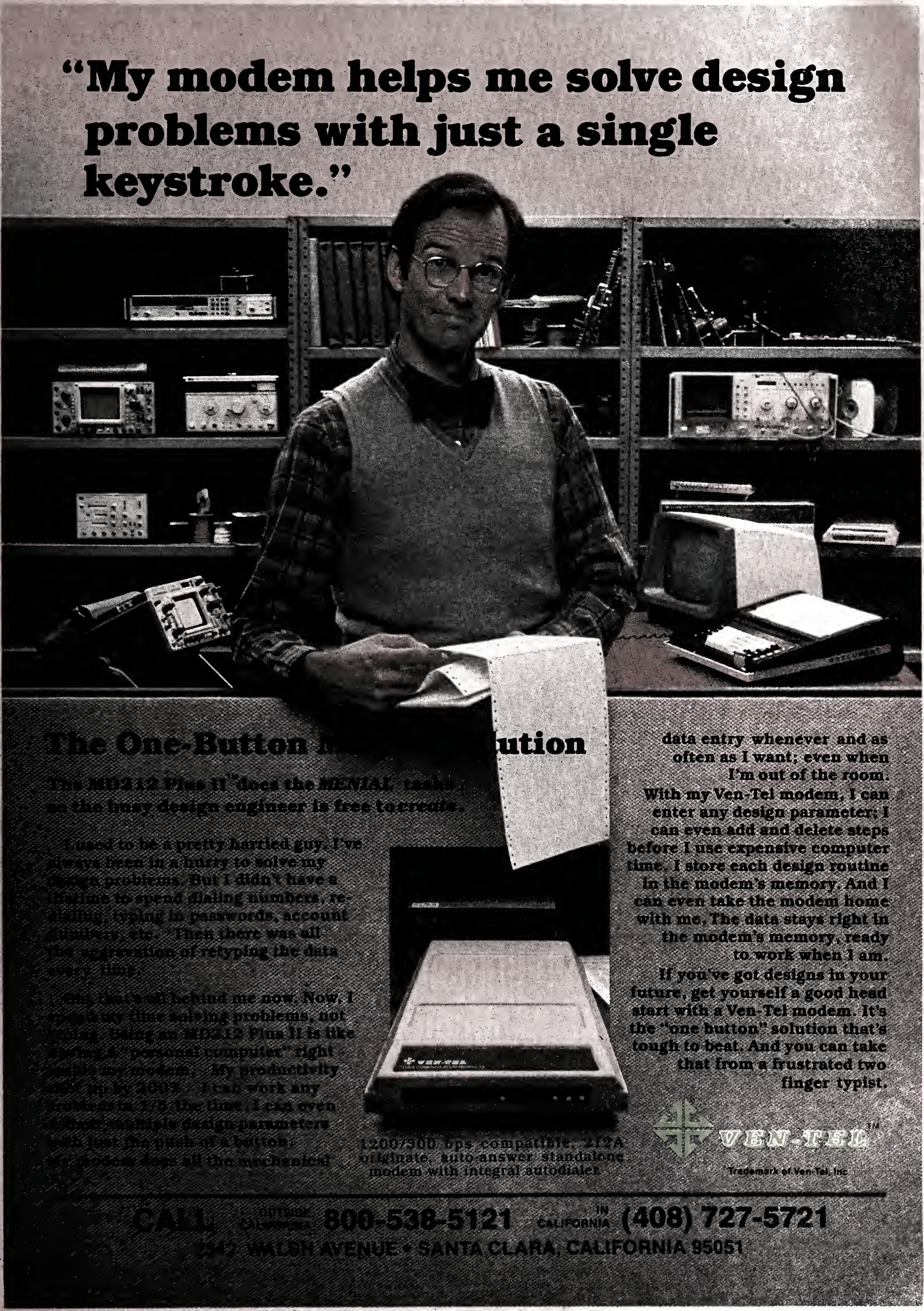

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Trucking Firm Makes Tracks With Packet Net

ST. CLOUD, Mich. — Anderson Trucking Co. replaced its leased telephone lines with a satellite-based packet switching network and, consequently, doubled the number of remote sites it has on-line and the size of the geographical area it covers while minimizing cost increases.

At its headquarters here, Anderson has a 4.5M-byte Burroughs Corp. B 5900 host mainframe running MCP. The computer has more than 1G byte of disk storage and eight data communications lines.

On-line to it are 55 CRT terminals at 11 sites throughout the country. The terminals emulate Burroughs TD 830 protocol, and DP manager Leroy Justin estimates Anderson transmits between 20 million and 30 million characters a month.

"Like most trucking companies," Justin said, "we use our data communications system for inventory and control. That means keeping track of not only where every driver, piece of equipment and potential load is at any given moment, but what they're all doing. With oversized loads, you also have data about every bridge, every turning radius and every grade along the length of the route."

Customer Calls

When a customer who has a shipment in progress calls the Anderson branch office in Spokane, Wash., an operator at a terminal there can punch in that customer's code and find out when the shipment left its point of origin, when the driver last reported in, whether there was any difficulty or delay and the estimated time of arrival.

If a call comes in from a potential customer, the person at the terminal can call Anderson's billing department in St. Cloud for a rate quote.

The operator can also tell the prospective customer how soon his load can be moved, how long it will probably take and what special permits will be involved. He can also find out which drivers and equipment are available to move it, since oversized or highly valuable loads often require experienced drivers.

Alternatives Sought

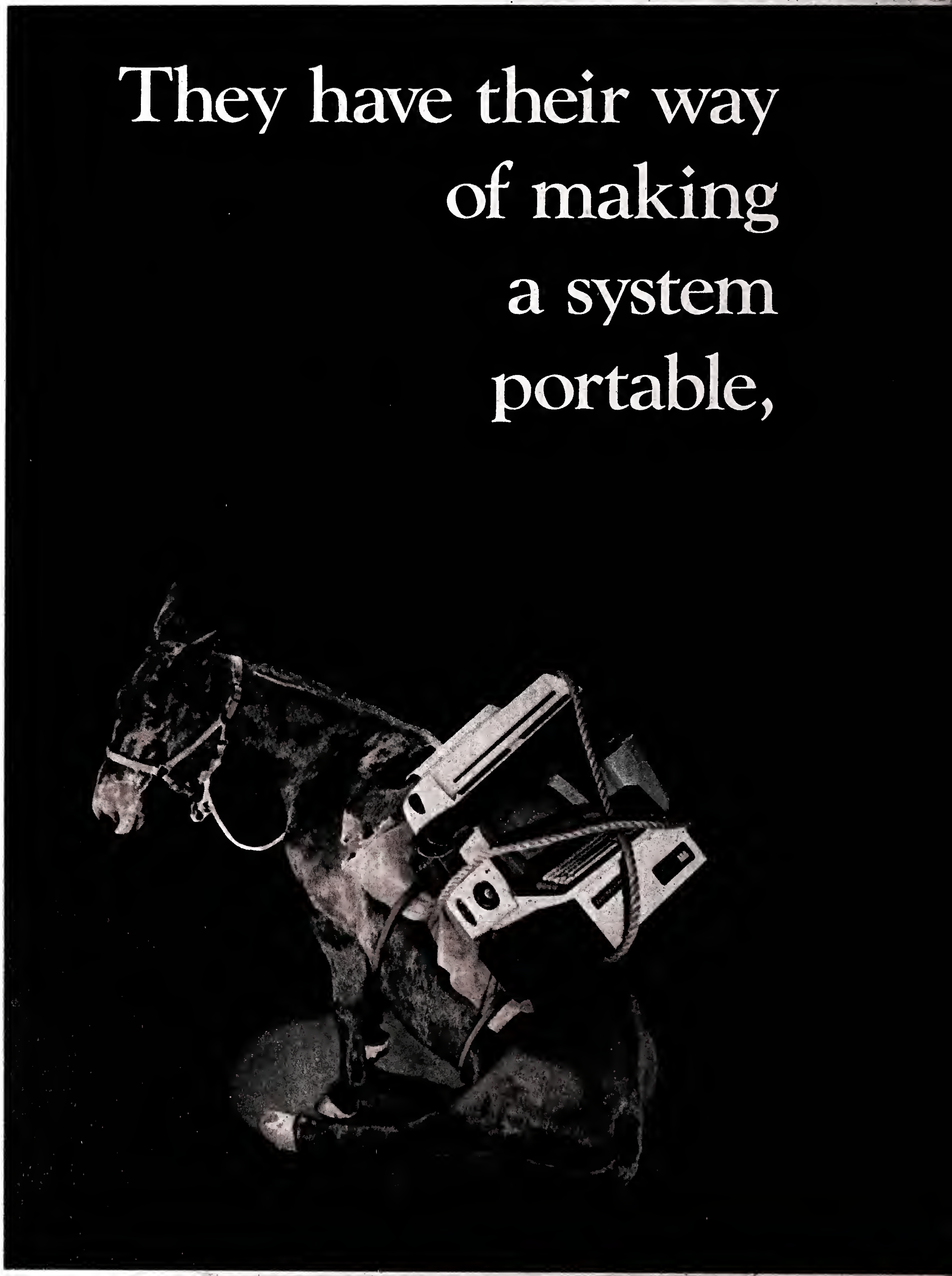
Until September 1981, Anderson was paying about $2,500/mo to have five remote sites in three states on-line to its host mainframe in St. Cloud. When AT&T rate hikes threatened to double that $2,500 figure, Justin started looking for alternative methods.

"Just about the time we had started to look around," Justin said, "[RCA Cylix Communications Network, Inc.] contacted us. They were in the process of doing some target marketing into the transportation industry. Their figures looked good, but at first we were skeptical. I guess our attitude was 'Show us.'

"They suggested we use the network on a limited trial basis, and we did, starting with one or two drops for a couple of months and then adding one a month. The trial gave us the chance to see how satellite links would work, and they worked so well that within a few months we'd signed onto the network."

Since Anderson switched to RCA Cylix service, the company has increased its number of "drops," or remote sites on-line to the mainframe, from five to 11 and the number of states in which they are located from three to seven. Its monthly bill is still about $4,000. Justin said he would be paying more than $5,000 for leased

(Continued on SR/34)



Volunteers Track Race With Computer Devices Terminals

Score Major Regatta

Terminals at Helm in Race

BOSTON — A software system used in conjunction with portable terminals cut from hours to minutes the time required to process and track nearly 3,000 rowers in over 700 boats at last year's Head of the Charles Regatta, the Grand Prix of rowing events held each year on the waterway between Boston and Cambridge, Mass.

The software programs, which served as the timing mechanism for the largest single-day rowing event in the world, were written by two members of the Regatta Committee who make their living in the high-technology field.

Charles E. Roth owns Industrial Computation, Inc. and Lawrence G. Copley heads his own communications and data processing consulting firm.

Their efforts on behalf of the Head of the Charles were voluntary, since the race continues to be a nonprofit event run by members of the Cambridge Boat Club. Roth and Copley's system allowed the race's coordinators to time automatically the boats' speeds, to enter and compute easily penalty points and almost instantaneously to call up results.

Donated Terminals

Computer Devices, Inc. of Burlington, Mass., donated the terminals that were located throughout the race site. They provided access to the timing and results system, which ran on NDC/Rapidata Corp.'s time-sharing computer in Braintree, Mass. Equipped with built-in acoustic couplers with modems, Computer Devices terminals can transmit data at speeds up to 1,200 bit/sec. This feature and the portability and reliability of the terminals were factors in choosing Computer Devices equipment, according to Dan Healey, who coordinated the timing teams this year.

Healey explained that at the beginning of each of the Regatta's 18 events, the 40 participating boats (referred to as "shells") arranged themselves in numerical order in the Charles River Basin, downstream from the Boston University Bridge. At the direction of the official starter, the shells proceeded, one by one, to cross the starting line at approximately 15-second intervals.

As the boats' bows crossed the start line, their official entry time was recorded in the system by a simple keystroke on a portable terminal.

Times Noted

The computer noted the time and the shells proceeded from a running start three miles upstream to where other Computer Devices terminals were waiting to register their finish.

"Once all of the 40 shells had completed the event, the starting times were automatically subtracted from the finishing times and the results

(Continued on SR/34)

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Trucking Firm Delivers With Packet Network

(Continued from SR/32)

telephone lines.

In addition, Anderson is spared the problems associated with managing its own network, since RCA Cylix assumes end-to-end responsibility for operations.

That end-to-end service includes protocol conversion where necessary, data concentration, diagnostics and error recovery and dealing with all the regional telephone companies involved. In short, it includes everything but Anderson's own terminals and mainframe.

RCA Cylix is a "value-added" data communications network that serves users with medium- to high-volume data communications requirements. (The network was just recently acquired by RCA Communications, Inc.)

With users always on-line via a permanent virtual circuit, RCA Cylix transmits data only, not voice or video, and offers an alternative to both low-speed, dial-up networks and very high-speed, high-volume voice/video networks.

There are currently about 130 contracted RCA Cylix users across the U.S.

The network's hub is in Memphis, Tenn., where a specially constructed earthquake- and tornado-resistant bunker houses the supervisory system (two Digital Equipment Corp. VAX-11/780s and two 11/70s) and message switching system. The roof of the bunker serves as a mounting pad for twin, 10-meter dish antennae, one pointing at the primary satellite and the other pointed at a backup satellite.

At each of RCA Cylix's 30 remote earth stations are two 4.6-meter antennae, multiple microprocessors that serve as a communications processing node and satellite communications equipment.

There is a 56K bit/sec satellite link between each earth station and the network control center in Memphis. To ensure reliability, every critical piece of equipment in the network has a backup.

Local data distribution is currently handled on 100,000 miles of lines leased from the telephone company: 9,600 bit/sec point-to-point lines and 4,800 bit/sec multipoint lines.

The user's point of connection to the networks is the "very smart" diagnostic modem (VSM) at the RCA Cylix earth station nearest the user's host mainframe.

The VSM pinpoints the source of transmission problems and transmits that information via a secondary channel to Memphis, where, if the problem is on a line, an RCA Cylix specialist can call the appropriate regional telephone company to dispatch service.

Currently supported on the RCA Cylix network are Burroughs Poll Select, IBM 3270 Binary Synchronous Communications and IBM 3270 Synchronous Data Link Control.

For Anderson, one of the biggest benefits of using the RCA Cylix network is centralized service.

"Instead of handling problems ourselves," Justin said, "we just call network services at RCA Cylix.

"They know who to deal with at the telephone companies, and they've been both quick and conscientious about analysis and correction of problems. What impresses me about RCA Cylix is their attitude: They go out of their way to be helpful," Justin said.

Terminals Time Major Regatta

(Continued from SR/33)

of each event were computed and printed out on the terminals within approximately 20 seconds," Healey explained.

These results remained unofficial until later in the day when the race's umpires handed in their reports. Positioned along the race site, the umpires watched for and recorded interference disqualifications or buoy violations as the oarsmen navigated the narrow, winding course. The participants were, after all, rowing backwards — upstream — and, in many cases, were without coxswain to help direct them.

The umpire's reports, which often determine the outcome of the event, were entered into the timing and results program at the end of the day's competition.

The computer program translated any violations into time penalties. If a boat cut short a buoy, for example, 10 seconds were added automatically to the boat's time by the computer.

The official results were then computed and printed out on the terminals in a matter of minutes, as compared with the many hours of paper shuffling, checking and rechecking of figures that would have been required without the time-sharing system.

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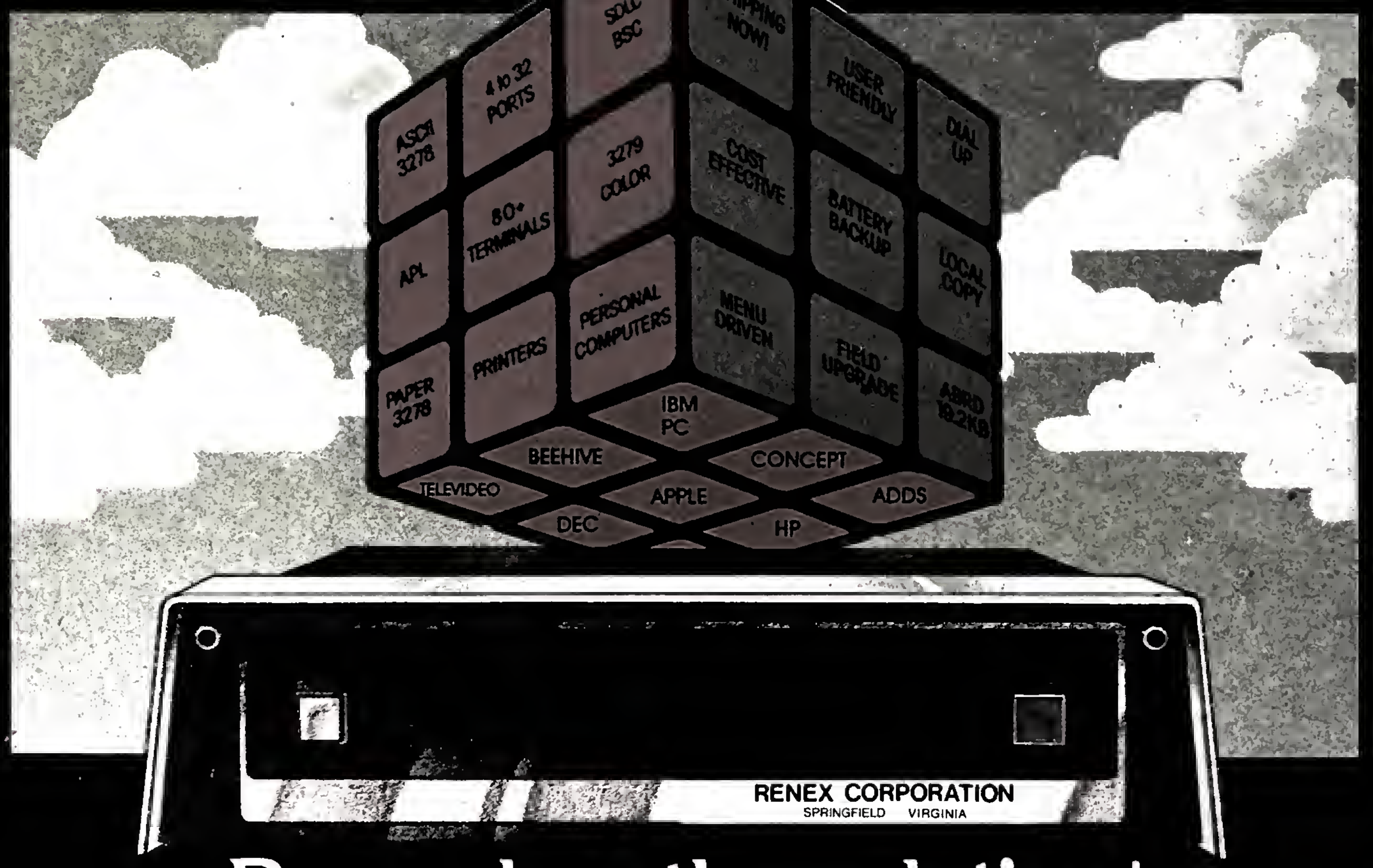

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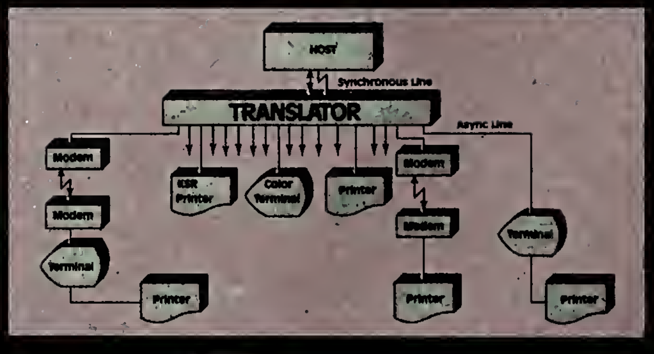

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Reduces Cost per Terminal by $120

Realty Firm Moves With Data Carrier System

CHICAGO — JMB Realty of Chicago purchased a data carrier system and reduced its cost per terminal by $120.

Steve Stern, JMB's manager of computer services, explained what led to the need for a data carrier system. "By 1979, the load on our batch-processing [General Automation, Inc.] SPC-16 system was getting out of hand. We had written the software for partnership accounting, general ledger and rental billing, but we were splitting the load into two 50M-byte disk packs, and our ability to respond to inquiries for information was falling behind.

"JMB decided to acquire a [Tandem Computer, Inc.] Nonstop 16 so we could put the information out where people could get it. The first application was general ledger inquiry, but we spent most of the first year, 1979, building our own programming tools," Stern said. "We use an in-house program we call CRTform as a data-entry package for all user functions — it's screen-oriented — and CRTtran, a compiler for building screens and tables," he added.

"We wanted to put data entry and modification in the hands of the people who are responsible for it and take out the intermediaries who have no feel for what reasonable data is. Unfortunately, key-entry people might enter erroneous data because they wouldn't know what the range of figures ought to be," he said.

"What we have now, to give an example, is a check reconciliation system for 500 bank accounts — one for each operating company. We can now pull the issued checks off the general ledgers and put them into check files. We take the tapes that show the cashed paychecks from the banks and our programs compare them with our own records. Those that don't agree, such as a few that are issued but not paid, can be reported out. Then we can modify the general ledger or the check files to show the true state of affairs."

Three Tandem CPUs, with large virtual memories, serve JMB well because, as Stern said, "everything is redundant; no single point of failure will shut the system down. The disk drives are paired, the disk controllers are paired. I can shut off half the disks and the only effect is a slower response time for users."

When the Tandems were introduced in early 1980, there were only a few terminals near the 38th-floor computer room, connected to the processor by direct cables. But as demand for computer services grew, JMB ran into physical limitations. The firm also had offices one floor up. To every office or desk where a terminal was required, they had to run a four-wire cable with big batch panels. That might have worked if the firm had stayed on the 39th floor, but JMB was growing by 10% a year and needed much more room for its 750 employees.

"The time came to move the accounting department to the 19th floor," Stern said, "and I started figuring what it would cost to string cables down 20 floors, each of them 15 feet high. I worked it out to about five miles of cable. That would have been cheaper than bringing in the Teltone Corp. system but the conduits were full.

"The building management just didn't have the space to let us run the cables, and two other factors were at work: Chicago building and fire codes require even low-voltage cables to run through conduits, and the building's own rules insist that journeymen electricians do the work, at about $30 an hour. When we added the labor and conduit costs, it got expensive very quickly. Then we saw a magazine ad for Teltone and called them up."

In early 1981, Teltone set up a six-channel demonstration package of their DCS-2B Data Carrier System. By connecting the terminals through an AT&T Centrex switchboard and splitting the data off the phone lines inside the private automatic branch exchange (PABX) room, the data could be sent by a single cable to the computer room.

With the DCS-2B Data Carrier System, data is transmitted with frequency shift keying, using 36 and 40 KHz to transmit data from the station unit to the termination circuit and 72 and 80 KHz in the reverse direction. Low-pass, passive inductance-capacitance filters are used to isolate the telephone and PABX from the high frequencies used in data traffic, allowing the telephone link to function normally. Full-duplex, asynchronous data at any speed up to 9,600 bit/sec can be carried as far as 5,000 feet on a 26-gauge wire pair for a maximum 17 db loss at 80 KHz.

To get the data to the computer room, one 50-pair cable can haul the data and voice to the computer room where it dumps the data and returns to the PABX with the voice. The cost is usually very low because the wiring is already in place.

At JMB, 64 Digital Equipment Corp. VT-100 terminals are used for data inquiry, entry and retrieval, and they run at the full 9,600 bit/sec. "In this company, even top executives use a terminal," said Saul Newman, JMB vice-president. "The alternatives were separate phone lines and modems, our own cables and short-

(Continued on SR/36)

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Few Networks Aimed at Small Business User

By Bob Buchanan
Special to CW‡

The advent of local-area networks promises the microcomputer user a significant potential for expanding system capacity to meet increased processing demand or for sharing information among a larger user community. However, of the many local-area networks that have been announced, few can effectively support the small-business user.

Most do not provide the "turnkey solution orientation" required by the nonprogrammer businessman, while others are not price-performance competitive against 8- and 16-bit multiuser systems. However, the networks that can meet these requirements will constitute the next generation of multiuser, small-business systems because of their significant advantages over single-processor, multiuser systems.

Networked microcomputers offer increased performance, reliability and flexibility over single-processor, multiuser systems. A single-processor system suffers from the same degradation problems that plague multiuser minicomputers and mainframes. As more users are added, each user receives a decreasing proportion of the system's capacity. This is one major reason why disgruntled users of these larger systems initially sought out single-user microprocessor systems.

Once the systems throughput degrades to an unacceptable level, growth can only be achieved through the installation of additional systems. Data-sharing and application-distribution problems across these stand-alone machines, as well as a significant incremental cost for the new system, are problems the user faces with this alternative. In effect, the same problems indicative of larger systems have been propagated down to the microcomputer, thereby nullifying many of the microcomputer's advantages.

With a network approach, each workstation retains dedicated processing capability. The performance per user remains relatively constant and is essentially independent of the number of users on the network. Networking also provides improved reliability, since the system does not depend on a central processor.

Therefore, the failure of any single workstation or server is not catastrophic. Processing can still continue, in a degraded mode perhaps, while the downed hardware or software is repaired. Carry-in or even on-site maintenance service may take several days through a dealer. On a single-processor system, this downtime could severely impact the business operation.

Increased performance and reliability of data-file backup and recovery are also achieved through networking. File maintenance on data servers may be accomplished while the remainder of the network continues uninterrupted.

For local-area networks to be employed successively in the small-business computer environment, they must provide "turnkey" functionality, ease of use and cost-effectiveness.

Turnkey functionality means that the basic applications running on the businessman's single-user system, such as word processing, accounting, and order entry, must be fully implemented in the multiuser network. The key process here involving the interaction between the data (stored on data servers) and applications (running at the workstations) is not adequately addressed by most network offerings.

Required features include:

- Concurrent file sharing for both inquiry and updates, such as between order entry and inventory programs.
- Automatic application downloading to workstations.
- Security/access controls.

Providing these features requires integration between the network software and the application programs.

Ease of use is achieved through the integration of many features. Since many business users start with a single-user system and expand to meet increased needs, the multiuser interface should look much like the single-user system. Businessmen do not want to be bothered with relearning how to run their applications, defining path names to files or selecting applications from appropriate data servers. To be successful, the

(Continued on SR/38)

Realtor Moves With System

(Continued from SR/35)

haul modems or the Teltone system. We went with Teltone. When the system is fully installed with 96 terminals, our cost will be about $50,000 — about $500 a channel. Teltone has already reduced our cost per terminal by about $120, incidentally, because we don't have to buy the current-loop boards for the VT-100s, which are very fragile."

JMB no longer has to maintain a network of cables either. "The work is not ours," Newman said, "it's the phone company's."

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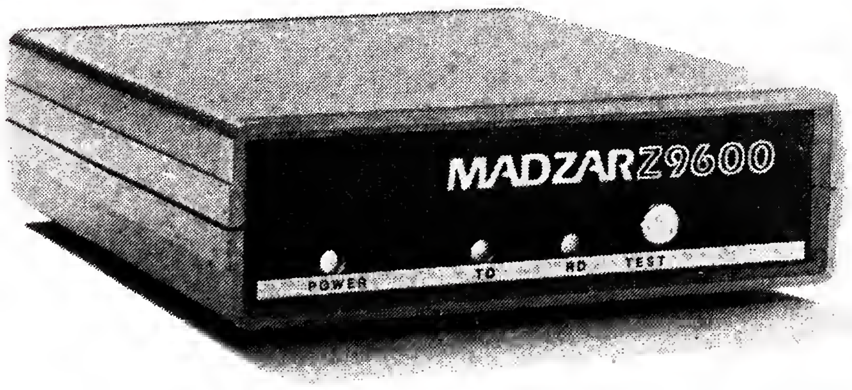

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An Unorthodox Solution

Lumber Firm Ties CRT, POS Terminals to CPU

BURNABY, B.C. — Normally having both CRT and point-of-sale (POS) terminals on-line to the same mainframe requires two networks. This is because the average CRT controller and the average POS controller do not coexist very well on the same telephone line. Orthodox solutions to this problem usually call for the signals to be multiplexed forming two logical lines from one physical one.

As part of a long-range business plan, the data processing services of Lumberland Building Materials Ltd. are being expanded to include a network of both CRT terminals and POS terminals. The head office has installed an IBM 4331 with 3M bytes of memory and 1,557M bytes of disk. Running under VM/DOS/VSE with CICS/DL1, the processor is intended to support a network of 80 POS terminals and CRT terminals by the end of 1983.

The majority of these terminals will be remotes, operating through leased telephone lines. This remote network is just entering the installation phase.

The objective of the remote network is to provide on-line CRT and POS terminals at each of the retailer's 11 home-improvement centers. The CRT terminals will provide information on the assortment of goods carried, purchase order writing, receiving of goods, inventory functions and management summaries.

The POS terminals will provide record of sale for individual items, returns by individual items, credit account payments and credit sales for both Lumberland's credit system and for bank cards such as Visa and Master Card, a spokesman from Lumberland said.

The credit processing is designed to verify that the card presented is valid. Given that it is a valid card, credit approval or refusal will be given to the cashier. For the bank cards, this involves direct contact with the bank's computer first and then returning the bank's answer to the cashier.

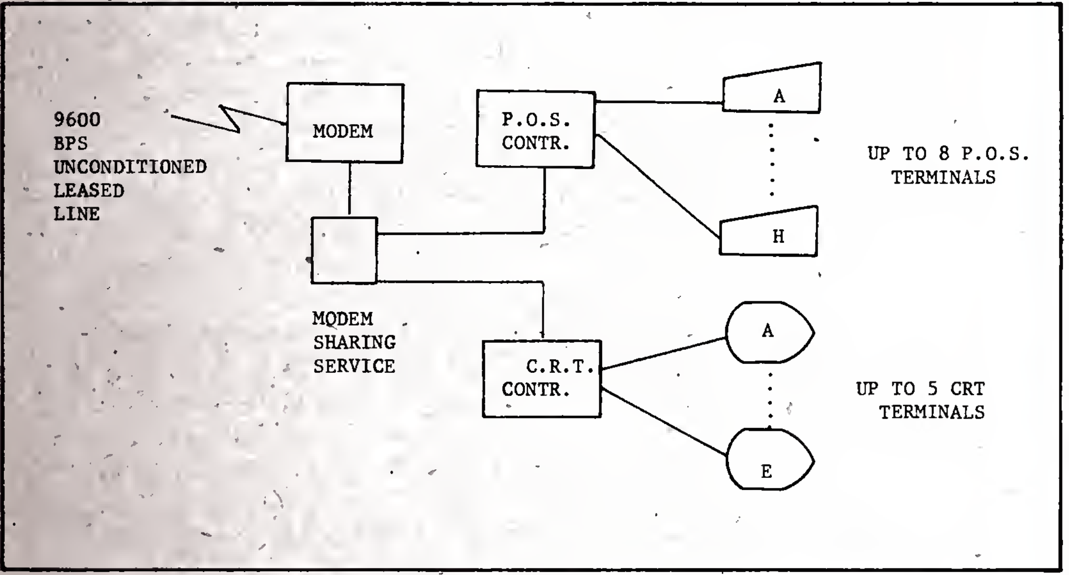
The objective is to return an answer within 30 seconds. This is a vast improvement over the current method. Now, customers wait five mintutes when telephone approvals are required during busy periods, a company spokesman said.

For Lumberland, the options of having two physical networks or multiplexing were both unattractive. Two physical networks would have cost an additional $25,000 a year for just the lines — with modems, $30,000 per year.

During the design, Lumberland was aided by technical personnel from the local telephone company, British Columbia Telephone. Using its model, the firm examined several network alternatives. Response times at various line speeds, numbers of terminals per line and network protocols were estimated.

This modeling indicated that the

(Continued on SR/38)



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Lumber Firm Links CRT, POS Terminals in Net

(Continued from SR/37)

principal component of response time was line speed. The number of terminals per line was the secondary factor. At three terminal/line and 4,800 bit/sec the expected average response time was seven seconds. This degraded to 14 seconds or more at least 5% of the time. At 9,600 bit/sec, the average was 3.5 seconds and the 95th percentile was seven seconds.

Factors other than line speed and number of terminals were modeled in these simulations. Other factors included the proportion of 3,000 character messages to other message lengths in the traffic pattern; assumed processing delay in the CPU; modem turnaround time; the overhead of the network protocols chosen; and the delays in the telephone network itself, the spokesman said.

Faced with users who requested 5-sec, worst-case response time, a 14.2K bit/sec line speed was considered. However, when relative equipment costs were explained to the users, a compromise of 9,600 bit/sec was reached. A compromising factor was that on some local lines, 14.2K bit/sec throughput was impossible to obtain consistently. In other words, the relative speed improvement would not be in proportion to the costs, the spokesman said.

Given the simulations, the company concluded that the CRTs required all the line speed they could get. Therefore, the option of reducing the line speed available to the CRTs by multiplexing the POS signals over the same line was very unattractive, the spokesman said.

The solution chosen was to select a protocol that allowed the CRT controller to seize the entire available bandwidth of the line. By operating in a polling mode, the chosen protocol dedicates the line to one controller at a time. The POS messages are so short at 9,600 bit/sec that they have no real effect on the CRT's perceived response time.

The protocol chosen was IBM's Synchronous Data Link Control/Systems Network Architecture (SDLC/SNA). SDLC/SNA will operate in a multidrop polled environment and it is compatible with the head office computer, the spokesman said. The company, therefore, specified that all

(Continued on SR/40)

Turnkey Best Solution for Small Business

(Continued from SR/36)

network software must handle these system management functions by making the networking of data and applications transparent to the user.

Cost-effectiveness is a measure of the system's performance per dollar spent by the user.

While the multiuser systems contain 15M bytes or more of disk storage bundled into the above price, the networked systems often have to amortize expensive shared-disk systems over the number of attached users. This may easily increase the cost per user by over $1,000 on small-business systems. If the data server can be incorporated into a workstation, better cost amortization results. This way, costs may be held to only a few hundred dollars per user.

Therefore, a primary question remains: Does a local-area network exist today that provides the features required for the small-business systems user?

Two types of baseband networks have been introduced: multivendor interconnect networks and single-vendor proprietary networks.

Multivendor networks allow devices from various manufacturers to be interconnected physically as workstations and data servers. Generally, files and programs can be transmitted between workstations, and users can do electronic messaging across the network. To pull data or programs down to a workstation or to send the same to another workstation generally requires that the user define the path (that is, workstation identifications, directories, file names and so on). This requires knowledge of the network's logical structure. Also, programs running at workstations cannot effectively share data.

A network of this type is valuable if an organization wishes to interconnect an installed base of dissimilar hardware. If network interfaces are provided, it also potentially allows a user to take advantage of hardware breakthroughs by different manufacturers.

Single-vendor networks require that all devices on the network be from the same vendor. This allows for fully integrated software that uses all the best features of the hardware. Gateways that allow external communications from the network to other vendor devices are generally provided.

The main limitation of such a network is that new hardware technology introductions cannot be included unless the network vendor provides a similar device.

One example of a recently announced local-area network directly targeted at the small-business user is North Star Computers, Inc.'s Northnet. The physical aspects of the network include a shielded, twisted-pair cable bus architecture.

Compared with single-processor, multiuser systems or the multivendor network system, the single-vendor network approach provides a better means of supporting the growing small-business systems environment. The multiuser systems of the '70s answered pressing needs for small businesses to have multiple users sharing the same data, but the user paid a price in reduced performance and reliability.

Buchanan is manager of software product marketing for North Star Computers, Inc., San Leandro, Calif.

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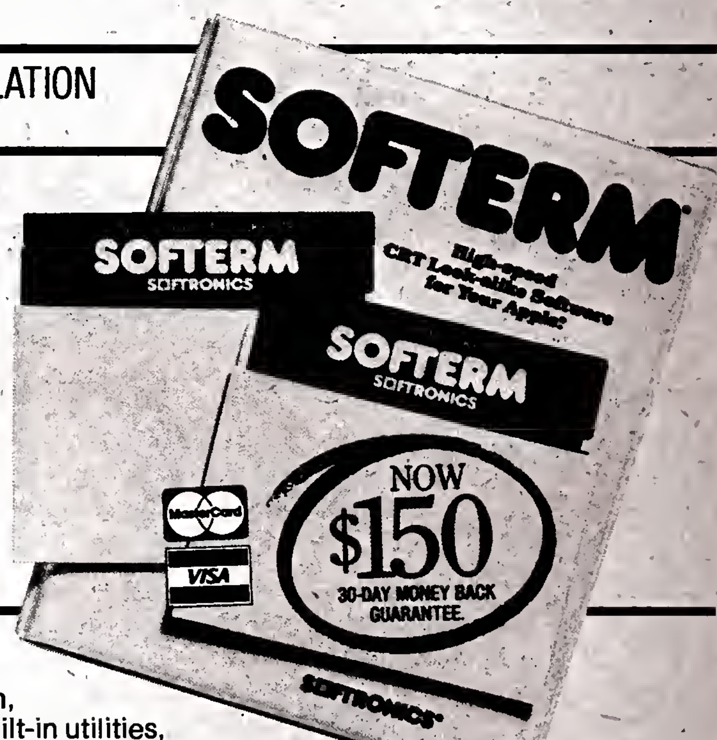

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National Group Ties State Offices via DDP Net

WASHINGTON, D.C. — The National Education Association (NEA) has installed a new distributed data processing (DDP) network, tying its state offices in an interactive, on-line web that could potentially reduce NEA network operating costs by an estimated $100,000 in monthly telecommunications charges.

The network is based on Nixdorf Computer Co.'s 8860 series.

Michael G. Putro, NEA's director of data processing, briefly outlined the selection problems facing NEA and the final solution: "We needed a network of computers that wouldn't force special operator training, yet would feature interactive, remote job entry (RJE) and DDP capabilities. The 8860, which supports IBM's System Network Architecture [SNA] for data processing tasks, lets us simultaneously run different remote devices like terminals, printers and on-site 8860's on the same data communications link.

Putro continued, "With this network, we now can handle batch entry and interactive processing jobs from many remote sites. When I extrapolate the dollar savings gained just from reduced telecommunications costs on our current 15-system configuration to the 50-state hookup planned by September 1983, we should save $100,000 each month. Intangibles like reduced operator training costs only add to savings and efficiency."

The NEA is the world's largest educational group, founded in 1857 to elevate the character and advance the profession of teaching and to promote the cause of popular education in the U.S.

Primarily comprised of elementary and secondary school teachers, the NEA exercises a strong voice in local community affairs through the Parent-Teacher Association and directs student/teacher communication. The group claims a membership of 1.7 million.

The very structure of NEA — with headquarters in Washington, D.C., affiliates in each of the 50 states, Puerto Rico and Europe and 12,000 local offices within the states — makes information management an enormous task. To compound the challenge, each remote site functions autonomously. Putro said,"We've literally got 50 states doing things 50 different ways. The same thing goes for our locals. Our function here at headquarters is basically to serve as a service bureau to the states, providing all DP and communications support."

In 1980, only the Atlanta and Denver regional data processing centers existed, primarily to process membership information. With NEA enrollment growing, Putro's task was to replace existing RJE equipment and open two new regional DP centers.

"From a price/performance standpoint, and because of overall system capabilities, I chose Nixdorf 600/45 systems for each site," Putro explained. "This hardware fulfilled nearly all of our data entry and [remote job entry] needs and also functioned as a very powerful processor." Each of the four regional systems is configured with eight key stations and a printer.

However, state affiliates still batch all business, mailing it to the regional centers for processing. Data was then keyed into data entry terminals and transmitted to Washington. The headquarters center generated reports, burst and decollated them and mailed the finished work to each state.

"This process took three, five or sometimes as long as 10 days, depending on timing and office locations," Putro said. "That's far from satisfactory when it comes to quickly processing vouchers, reimbursements for utilities and other accounts payable and general-ledger-related activities."

Putro believes he could have placed "dumb" RJE terminals at each state office, "but that would have required operating in an IBM 3790 Binary Synchronous Communications point-to-point mode for batch in addition to the existing multipoint bisynchronous 3270 network for interactive mode. The cost of running the required data communications lines would have been prohibitive."

Therefore, NEA conducted a market survey of products from several major systems manufacturers, including IBM, Harris Corp., Four Phase Computer Systems, Inc., Datapoint Corp. and Nixdorf. "IBM was having problems with their 8100, in terms of installation complexity, dif-

(Continued on SR/40)

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Group Links State Offices With DDP Net

(Continued from SR/39)

ficult operation and expensive support," Putro recalled.

"And all other vendors except Nixdorf claimed their equipment could operate in either 3270 or [RJE] mode," he said. "However, Nixdorf's 8860 with SNA could function concurrently in both modes, a feature which not only resolved the problem of merging batch and on-line capabilities in a single terminal unit, but also enabled us to utilize a wide range of anticipated data processing functions."

Putro said the Nixdorf equipment was fully compatible with the NEA's IBM mainframe, could also communicate intelligently with other 8860's and featured easy operation and modular expandability "so we could economically customize systems to suit the work volume from each state location.

"Concurrency, though, was the operating feature that triggered our final choice, because as we added systems to the overall network, we wanted to save data communications line costs," Putro said.

In autumn 1981, six 8860 Model 10 systems had been installed — one in Washington, D.C., headquarters and five pilots in state locations. By August 1982, 12 states handled all data processing with their 8860 systems.

Four additional installations are scheduled for the near future. The specific system configurations vary with the size of each site, but each state office has between three and eight terminals and either a 300 or 600 line/min printer installed.

The CPU has 512K bytes of memory, a fixed/removable disk drive, a diskette drive and four communications channels. Each 8860 system can be upgraded in the field with up to two magnetic tape drives, 12 additional communications channels and a maximum of 24 workstations and four disk drives.

These systems communicate with twin 8M-byte IBM 4341 Group 2 mainframes at Washington headquarters, which also houses the entire NEA data base on an array of 52 Model 3350-compatible disk drives.

The next system network evolution is at the local level. "We are now considering ways to enlarge our locals," Putro said. "One option is to provide them with either remote workstations or personal microcomputers. In this way they can tie into our 8860s at the state level and then on to the NEA mainframe hosts.

"This is precisely why we went with Nixdorf's SNA. It not only reduces line costs, but it is the common bond of future communications protocols. It has been accepted as a de facto industry standard," he said.

Terminals Tied To Network

(Continued from SR/38)

remote terminal systems must be able to operate in such an environment.

Given the effects of adding terminals to a line, the preference was to run one line to each store. The costs of doing this were acceptable, and it was still cheaper than running two physical multidrop networks. However, a restriction on the communications capabilities of the Lumberland's head office's 4331 arose here, according to the spokesman.

Integrated Adaptor

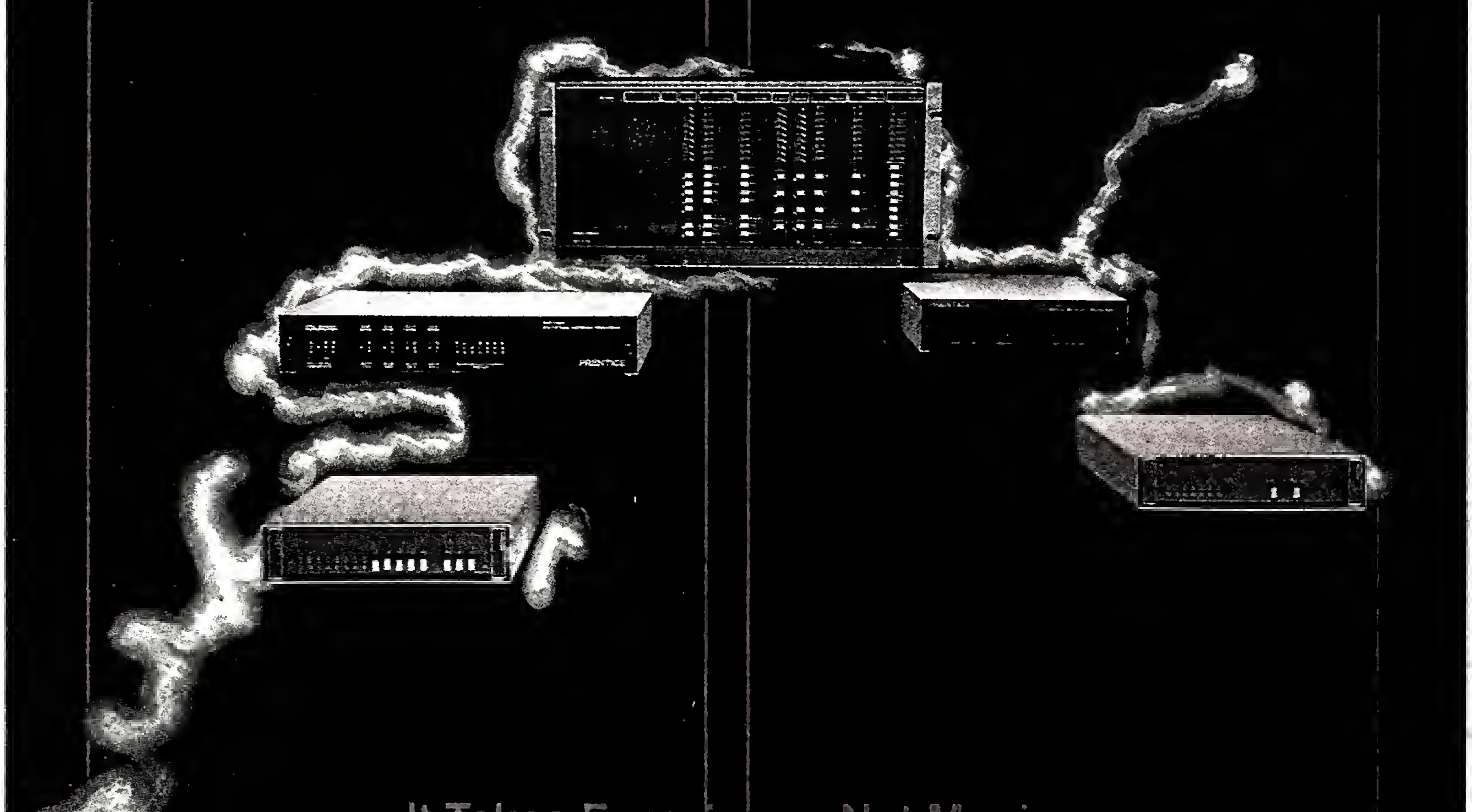
The 4331 handles telecommunications lines through an integrated communications adapter (ICA). An IBM 3705 is an option, but costs about $3,000/mo on rental. The ICA has an aggregate input limit of 64K bit/sec. This is the configuration limit, not an instantaneous throughput limit, the spokesman said.

Eleven stores multiplied by 9,600 bit/sec requires a configuration of 105K bit/sec. The alternatives were to install a 3705 or put several stores on one line.

To decide, Lumberland returned to projected traffic volumes and response time simulations. These showed that three smaller stores together had about the same projected traffic volume as the largest store. Theoretically, placing them on one line should give them the same response as given to Lumberland's largest store.

The final network then became an ICA running seven lines configured as follows: four individual lines running at 9,600 bit/sec; one 9,600 bit/sec line shared between two stores; one 9,600 bit/sec to make up the 64K bit/sec capacity.

At each store, a CRT controller and a POS controller shared the modem and the line. (See Figure on SR/37). First, the functional and performance goals of the network were established. Then through a series of refinement steps, the costs were reduced and the technical problems resolved.



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Planning Yields Geisco Cost-Effective Network

**By Daniel Casco,
Dr. David Castiel
And John-Francis Mergen**
Special to CW‡

ROCKVILLE, Md. — As a result of the dynamic nature of their environment, telecommunications and DP managers are constantly faced with a broad array of possible alternatives for meeting their data communications needs. Conventional networking strategies based on leased, public dial and Wats lines are increasingly challenged by newer alternatives, such as value-added networks, satellite networks and dial services offered by other common carriers.

Planning needs have gone beyond the "back of the envelope" tool used to deploy many early data networks. Data communications systems have become critical to the operation of many businesses.

The selection of the proper communications strategy for a given networking requirement is complicated by the need to evaluate systems that employ a mix of data carriers, along with the trade-offs between cost and performance levels considered in the configuration of a network. This evaluation process serves as the basis for the selection of the most viable, cost-effective networking strategy.

General Electric Information Services Co. (Geisco) has faced the problems and opportunities described above in the process of supporting its worldwide telecommunications network. As the alternatives have proliferated, the requirement for the development of sophisticated modeling techniques to pinpoint the best solution has grown.

The techniques developed for internal use at Geisco can be used to examine and select systematically the most appropriate mix of communications services available to the telecommunications and DP managers, without the cost associated with designing and analyzing all possible implementations.

These techniques have been integrated into a Network Modeling System (NMS) by the Delivery Systems Department at Geisco. NMS allows the analyst to specify various network requirements, vendor tariffs and design parameters; to configure and optimize networks for AT&T leased line, Wats and direct distance dialing offerings and for selected value-added networks offerings; and to describe the optimized line and equipment configurations and their costs and detail or summary reports.

Outstanding features of NMS include the ability to configure networks with multipoint lines, multipoint lines with concentration, Wats/Foreign Exchange dial access, value-added networks with dial and/or private access for both terminal and host equipment and value-added networks access with concentration.

These services can be modeled at varying performance levels. The model runs on Geisco's Mark III remote computing service in an interactive or batch mode. In addition, NMS has been tested on a 700 network application, but it was designed to handle up to 2,000 network locations.

Using the NMS described above, Geisco is seeking to develop general guidelines to accelerate the isolation of the proper communications mix for various classes of networking applications.

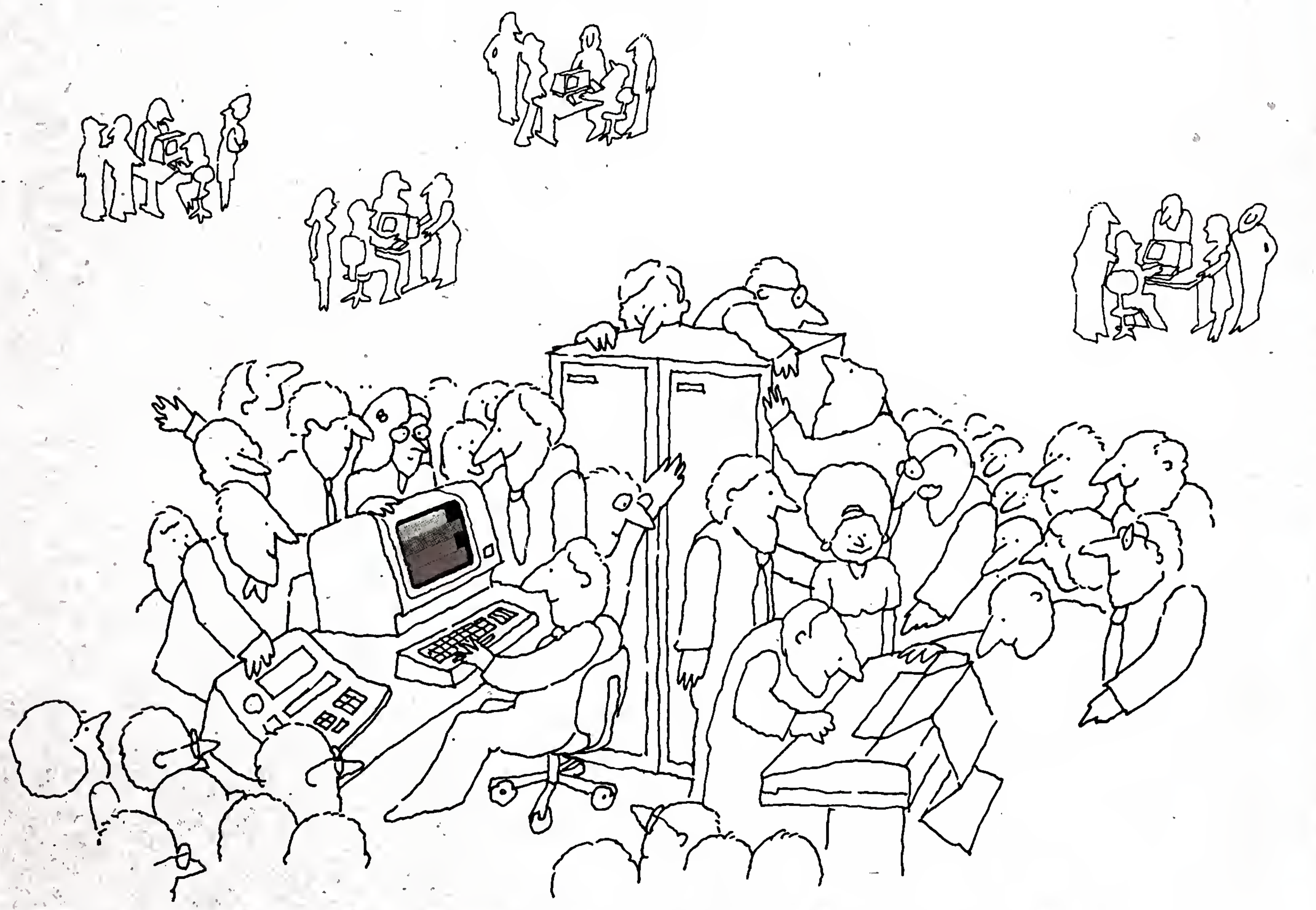
A three-step procedure has been selected to obtain these guidelines:

- A set of characteristic network user scenarios was gathered. These user scenarios represented the traffic and coverage requirements of various classes of network applications. Typical networking applications include a variety of applications, such as corporate data network services, credit authorization systems, order entry and inventory control systems. In addition, various banking, credit, insurance, manufacturing, public utility and computer service applications were profiled in the set of user scenarios.
- The network modeling system was used to configure and optimize networks for different vendors and offerings.
- The results of the modeling exercise were analyzed to obtain the impact of vendor pricing levels, deployment patterns, service levels and service offerings for classes of networking applications.

The results from the analysis have shown that some general rules do exist for the identification of customers best served by value-added networks, direct distance dialing and Wats. There appears to be an area in which value-added networks have a clear advantage over all other data communications alternatives.

This area is bracketed on one side by Wats and direct distance dialing implementations and multischedule private-line structures on the other side. One of the key factors affecting the selection of value-added net

(Continued on SR/44)



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IBM System/34 User Goes Remote for Less

SCHAUMBURG, Ill. — How does an IBM System/34 user lower remote processing costs and expand telecommunications capabilities at the same time?

That was the question facing Omron Electronics, Inc. two years ago, when it wanted to provide greater remote processing activity for sales and service, while adding more remote on-line workstations.

Omron, a subsidiary of Omron Tateisi Electronics Co. of Japan, has been marketing and distributing electronic products and systems in the U.S. for nine years. The subsidiary started in the U.S. in 1973 with one employee and now comprises two divisions in the U.S. and Canada: Control Components and Retail Systems.

Its quick growth "has brought about some predictable and yet some unique organizational concerns," explained Tom McGucken, assistant vice-president of finance and administration.

"Other than the ability to handle our pure volume of activity, the System/34 is a very good computer," McGucken said.

"We've been fortunate enough to have developed good software. Consequently, the only drawback, as we perceived it in our operation, was the systems communications capability," he addded.

Major DP Operations

Omron's major DP operations are order entry, inventory control, distribution, billing, accounts payable/receivable and general ledger. About 25% is done in batch mode and the rest is interactive.

In January 1980, the firm installed its first System/34 and then doubled its computing power by adding another system in November of that year. With two System/34s supporting over 30 5251 workstations and tabletop printers, one system printer and an IBM 6670 Information Distributor, Omron faced yet another challenge in improving its system's capabilities.

With one System/34 used primarily for word processing and development, how could the firm expand the communications capability of the second System/34 to provide greater remote processing activity for sales and service while adding more remote on-line workstations?

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(Continued on SR/44)

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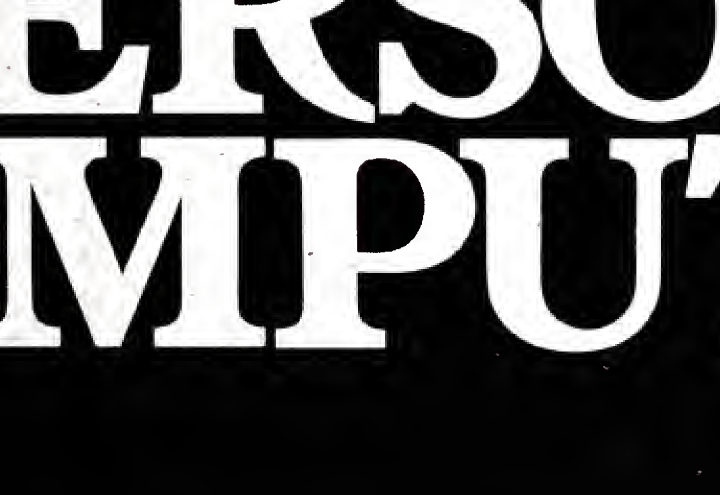

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System/34 User Saves While Going Remote

(Continued from SR/42)

five regional offices to share. Regional offices are located in Canada, Massachusetts, Georgia and two in California. "It was an unworkable situation because no one could ever get through," McGucken said. With the two divisions wanting more autonomy for their regional offices to enter orders, they had to look at how they were going to get more lines into the System/34.

At that point, of the four available communications lines on the System/34, one was connected to the 6670, another direct line was connected to its local warehouse and the remaining two serviced its five regional offices.

Two basic alternatives were considered: to replace the two System/34s with a System/38, which has eight communications lines available; or to order a Series/1 with 16 ports to be used as a multiplexer to the System/34.

While the Series/1 alternative was being proposed to Omron's management, however, a third alternative was presented. John Katich of Zink & Katich, Inc. in Lansing, Ill., and Michael Sweeney of Sweeney Computing Corp. in Burr Ridge, Ill., met with McGucken to present their new product.

Access/34 was designed to allow the System/34 user to communicate interactively with low-cost asynchronous devices not directly supported on the System/34 by IBM.

Access/34 carries a $12,000 price tag, as opposed to Series/1's $90,000 price that includes software but not support of 5251 Model 12s.

Further Savings

Omron also decided to move to IBM's Displaywriters, which feature asynchronous and binary synchronous communications communications capabilities and cost about $150/mo less than the 5251 Model 12s. One Access/34 with eight ports was ordered, along with 13 Displaywriters. Eight Displaywriters were to be placed in the office here for word processing. Three weeks later, Digital Research, Inc. announced CP/M for the Displaywriter.

Access/34 reportedly was installed and operational in less than an hour. In a period of five months, Omron had gone from being completely out of remote processing power and not knowing where to turn regarding communications to developing a cost-effective, efficient and versatile network.

Planning Yields Net for Geisco

(Continued from SR/41)

works is the cost of the local distribution system.

The results of the network modeling system have produced a set of attributes for the local distribution needs of selected network applications. These attributes can be used to differentiate among those network applications that will benefit from value-added-networks-based solutions and those that should opt for conventional circuit-switched-based solutions.

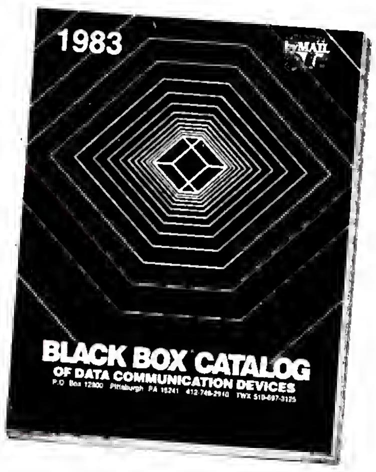
Alternative applications of the modeling system address specific technology issues, such as local concentration mechanisms and local distribution mechanisms, including local-area networks, private branch exchange (PBX), microwave and cable networks and their impact on the use of value-added networks.

Preliminary results from this type of analysis indicate that the greater the reduction in the local-loop cost, the further improvement in the regime where value-added networks already enjoy a cost/performance advantage over other systems. This means that users who have installed local-area networks and digital PBXs to increase installation flexibility, reduce cabling cost and improve reliability will also realize cost improvements in the reduction of long-haul data communications costs of using value-added networks due to the reduction in local-distribution costs.

In summary, the lessons learned from continued planning and modeling experience show that:

- Alternative strategies in network planning have increased in number and complexity.
- Network modeling aids in the systematic analysis of these alternatives and reduces the complexity and uncertainty of the selection process.
- The complexity of network planning can be reduced by the association of generic attributes of specific classes of network applications to appropriate communications strategies.
- Evaluation of specific technology issues can be simplified through the use of a comprehensive modeling system.

Casco, Castiel and Mergen are project managers at Geisco, Rockville, Md.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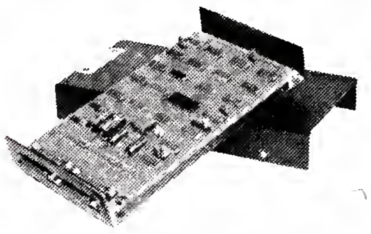
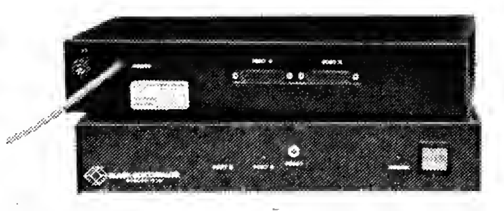
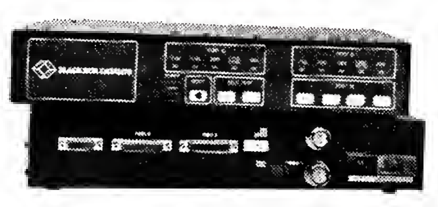


Interface Converters (12 Models) The need to convert from one interface to another grows as new equipment comes to market or as new interface specifications improve and change. The **BLACK BOX® Catalog** supplies 12 models of Interface Converters enabling you to "mix" interfaces such as RS-232/IEEE-488/BCD/ANALOG/Wideband/V.35/RS-422/RS-449/Sync and Async.



Communication Adapters (9 Models) Microprocessor based adapters are in stock at **BLACK BOX® Catalog** to enable compatible connection of RS-232 devices that require adaptation due to speed/code changes, ASCII to Baudot, Telex, Ticker Tape, X-ON/X-OFF Control, Multi-Modem or Error Control. Standard programs may be adapted to fit your particulars.



Protocol Converters (5 Models) To enable "dumb" ASCII terminals to converse in IBM Bisync, IBM System 34 or 38 Twinaxial SDLC, or other "intelligent" protocols, the **BLACK BOX® Catalog** supplies microprocessor based protocol converters which converts differences in transmission mode, code, and speed—plus changes in communication protocol and dataflow control.

These are examples of the type of low cost equipment you will find in the "Communicator's Bible." Send for your free copy to investigate the above products—plus 7 models of Modem Eliminators, 6 models of Limited Distance Modems (Line Drivers), 8 models of Printer Interfaces, 8 models of Terminal/Port/Modem sharing devices—plus multiplexors, channel splitters, tools, wall plates, junction panels, etc.

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Manages Millions of Credit Histories

Software Collects Kudos From Credit Company

DALLAS — In 1897, J.E.R. Chilton Sr. began the business of collecting credit information. He coded and entered data found in the files of prominent Dallas merchants in a small red notebook and later published the first known credit rating guide.

Years later, his company pioneered another new concept in credit reporting — only this time with the help of computer hardware and software.

In 1968, Chilton Corp. successfully automated a credit bureau operation, reportedly one of the first systems to provide on-line access to credit information. It is known as the Credimatic System.

Information Warehouse

Today, Chilton is one of five U.S. companies that provide automated consumer credit reporting services. The company serves as a warehouse for information regarding the paying habits of millions of people.

Chilton originally used an internally developed data base system to manage the credit histories of its subscribers' millions of customers. As the system grew, network and file structures became increasingly burdensome to maintain, a Chilton spokesman said.

This led Chilton to migrate to data communications/data base software from Applied Data Research, Inc. (ADR). Chilton installed ADR's Datacom/DC teleprocessing monitor in 1972.

More recently, Chilton chose ADR's Datacom/DB data base management system. "We wanted something which would simplify maintenance, development and performance considerations," said Ed Frazier, Chilton's director of data processing administration. "Datacom/DB's inverted index was absolutely essential for the rapid data access we needed."

Today, Chilton supports nearly 5,000 terminals on a communications network of over 2,000 telephone lines spanning the country. Chilton averages 1.3 million to 1.6 million transactions daily with one- to two-second response time.

Chilton's service bureaus provide the major source of the company's $50 million in revenues. The quality of data management is reflected in several service areas — data processing for affiliated bureaus, check authorization, collection services and credit reporting, the Chilton spokesman said.

Meeting Customer's Needs

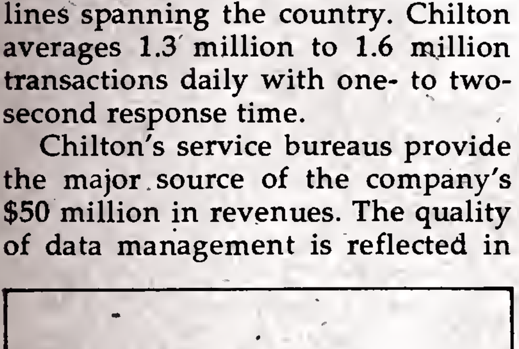
The production and delivery of information services and the development of new services helps Chilton change in response to customer's growing needs — changes made possible through the evolution of computer technology.

Chilton's check authorization system, built around ADR'S Datacom/DB and Datacom/DC, provides up-to-the-minute information on 3.2 million consumer check writers to more than 2,200 subscribing banks and retailers.

Chilton's collection system is a batch-distributed Datacom/DB system with 14 remote job entries supporting regional collection centers. Using Datacom/DC, the host system manages data retrieval of 4.5 million records available on line, the spokesman said.

The system can transfer accounts to a central location in 24 hours, acknowledge the placement of the accounts, generate collection notices and place a collection file in a telephone collector's hands.

To support application development activity, Chilton uses ADR's Datadictionary with on-line update. Don Taylor, Chilton's manager of data base administration, said Datadictionary is the central source for Chilton's documentation and is always current. It is the focal point for the integration of ADR's entire product line.



Most of Our Customers Require Somewhat Less Support Than This, Mr. Schultz.

"This system has been faultless. We anticipated problems; we didn't have them."

Alan Lewis, *Systems Manager, Thom McAn*

Increasingly, companies who consider *any* downtime unacceptable have been turning to Stratus, a company with a reputation for high reliability that lives up to its billing. Comments by early Stratus customers indicate that Stratus has delivered on its promise of a hardware solution to fault tolerant processing. These companies were surprised by other Stratus qualities they hadn't expected, and an operating system called ". . . light years ahead of others we've had to work with," by a major Wall Street brokerage firm.

Here's what companies who came to Stratus because they need a high reliability computer are saying:

"We have 10 programmers on our Stratus project. They are all extremely pleased with the Stratus hardware and software. The Stratus support has been excellent—even better than expected."

Bill Swigart, *Executive Vice President, A.C. Nielsen*

"Converting from an IBM 4341 to Stratus was the easiest conversion I've ever done."

Paul Femino, *President, FEMCON, Software consultants to West Lynn Creamery*

"I'm incredibly impressed with the quality and maturity of Stratus's software and hardware."

Michael Feldman, *Vice President, Technology Consulting Corp.*

"Anybody can learn the Stratus editor in a few minutes. I find our programmers are dealing with the applications, not fighting the computer environment."

Tony Peraino, *Software Contractor, Macomb Multiple Listing Service*

If one thing that's been holding you back from looking at the Stratus Continuous Processing system is a proven track record, give us a call. We have a fast growing list of "track" records who are willing to tell you about their experiences with Stratus. To get more information call us at 617-653-1466.

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Now that the world relies on computers
it needs a computer it can rely on.

Bank Counts on ATMs for Franchise Program

LOS ANGELES — With financial institutions competing in an environment of deregulation and technological change, First Interstate Bankcorp has opted for franchising as a way to generate additional income.

The holding company, located here, is comprised of 21 member banks in 11 Western states. The corporation offers a franchise program which will enable nonmember banks to capitalize on the resources and technology of the $40 billion financial institution. Franchising allows each bank to access account data through 6,000 teller terminals and utilize more than 700 automatic teller machines (ATM), according to a bank spokesman.

"Franchising is appealing because it allows us to extend our influence and generate income beyond the 11-state territory without a large capital commitment," according to bank Executive Vice-President Alex Hart. "Bankers who find it increasingly difficult to compete in the emerging competitive environment can succeed through franchising and retain ownership of their banks."

Ranking eighth in assets among U.S. banking companies, First Interstate's 21 banks have 930 domestic offices that serve 476 communities. All branch offices are linked to a large IBM 3081 processor here. Each bank accesses account data directly through one of 6,000 IBM 3604 teller terminals. They also utilize more than 700 ATM's which are linked to the 3081 via 50,000 miles of communications lines. The entire system is known as the Teller Item Processing System (Tips).

With two banks as franchises, First Interstate plans to add as many as 10 banks within the next 18 months. All banks adopt First Interstate's name and logo, participate in a common advertising program and subscribe to a certain number of financial services offered through Tips. In addition, the franchised bank is granted a territorial exclusive, an Interstate spokesman said.

When a new franchise is added, Interstate links its existing hardware to the system or provides them with the new equipment, such as IBM 3604 teller terminals and IBM 3624 ATMs. New customer account data is loaded into the system and the franchisee goes on line with Tips. The bank's customers are issued First Interstate Bankcards, giving them access to cash and bank services throughout the Tips network. Tips now covers the Western states, a spokesman said.

First Interstate has more than 300 full-time programmers dedicated to product development. In support of the Tips network, First Interstate has implemented a comprehensive on-line network control center to perform problem tracking and resolution, a bank spokesman said.

The control center is staffed by 30 full-time technicians and banking application specialists. Since it is cost effective to have many banks utilize a single data processing system, Hart believes the First Interstate will keep ahead of the competition by offering the latest financial services at the lowest cost.

"The future of the financial service industry is on-line," Hart said. "Those who can deliver a product with the highest degree of reliability and the greatest customer appeal at the lowest cost will be most successful."

Remote Units Get Energy Specs To Field Salemen

VALLEY, Neb. — More often than not, the duties of irrigation systems sales extend well into the agricultural hinterlands. So, it is difficult to get quick access to information critical to keeping customers informed and order books filled.

In an effort to give its sales staff and distributors the information they need during sales calls, Valmont Industries, a manufacturer of irrigation systems, developed a computer service designed to provide marketers with precise energy measurement for the company's mechanized irrigation systems.

The Valcom system, installed a year ago, consists of over 100 Texas Instruments, Inc. portable data terminals, through which the sales force can communicate from the road with the company's IBM 4341 at Valmont headquarters here.

According to Bob Ward, manager of market information, the TI Silent 745 terminals enable the sales force to communicate directly with the host to provide the farmer with a detailed analysis of the irrigation system planned, revealing which systems are most energy efficient and, therefore, best suited to the farmer's needs.

(Continued on SR/48)

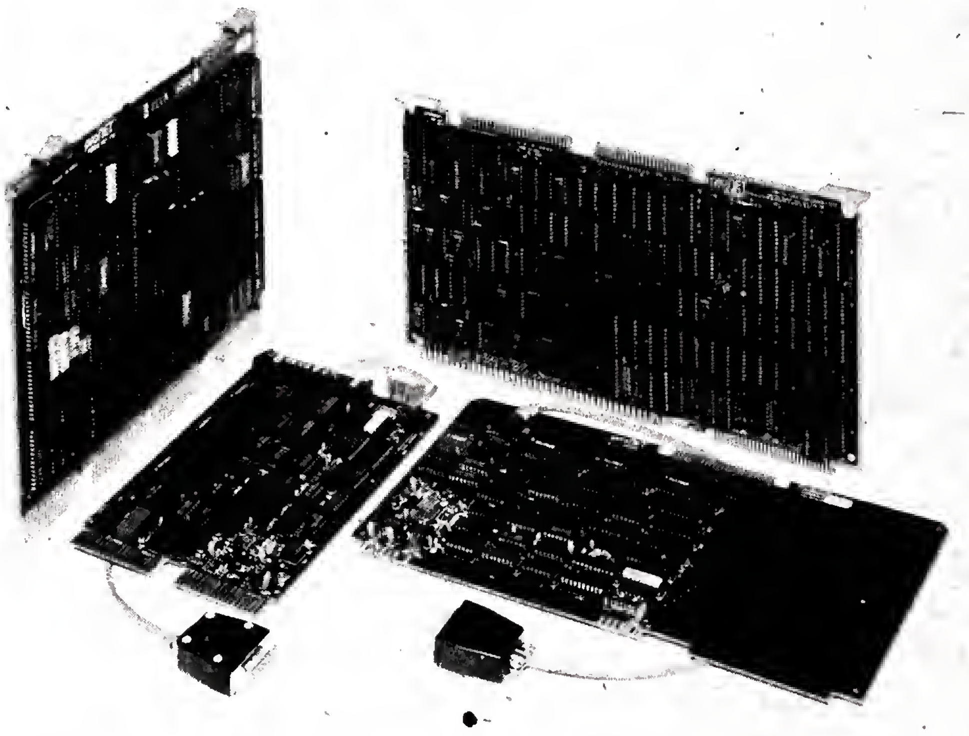
Talk about Reliability... proNET™

The Local Area Data Communications Network

When it comes to reliability, proNET is ready for your most demanding tests. Exceptionally low error rate, even at full capacity, is insured with a well designed synchronous data modem. The kind you'd find in a satellite earth station. The proNET "Wire Center" automatically diagnoses and isolates defective nodes for fail-safe operation. It is also a handy maintenance tool because it provides rapid fault location, a function not inherent in CSMA/CD Bus systems. (How do you locate a short circuit on the bus in a 40 story building?)

But that's not all that makes proNET the Logical Alternative. It supports high-speed communications among several hundred users per ring... with ordered queuing even in a heavily loaded system. (Token passing guarantees access with a maximum limit on communication delay.) And, proNET is compatible with virtually all communications media – twisted pair, twin-axial cable, microwave, and is particularly suitable for fiber optic links.

Very little software is required to execute a communication transaction. Everything is handled easily by proNET hardware. The operations required to send and receive messages are similar to those required for writing to and reading from a disc via DMA. RSX 11M, RT 11 and VMS drivers are available now. The proNET system is already running on UNIX-based VAX® installations which provide Remote Log-In, File Transfer and Electronic Mail functions.



The proNET system consists of a Control Board and a Host Specific Board, both installed in each host computer. We're ready to let proNET's performance answer ALL your questions – on performance, reliability, and cost. Call us at:

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Available 99.98% of Time

Fire Department Hot on Mobile Dispatch System

PHOENIX — The city's fire department here has completed the first nine months of operation of an advanced computer-aided dispatch and mobile digital terminal system. During this time, the system has been available 99.98% of the time.

The computer-aided dispatch and mobile digital terminal system was designed to support the needs of the fire departments of Phoenix, Glendale and Tempe, Ariz. It reportedly serves an area of 540 square miles, with an estimated 225,000 dispatches annually.

The turnkey system, from Planning Research Co., Public Management Services, uses the latest technology, incorporating many new devices, applications and concepts. It is thought to be the first application of mobile digital terminals in the fire service.

The members of the project development team of the system had all served as fire fighters, which provided them with an understanding of the tasks that needed to be performed by the system.

The system has improved the ability of the departments to respond to emergencies by making it possible for dispatchers to keep up with the calls during peak periods, a department spokesman said. It has increased the safety for the public and fire personnel, has allowed more effective assignment of personnel and equipment and has automated data collection for management reports, according to a department spokesman.

The system is currently operating in 47 fire stations, 148 mobile digital terminals, 10 administrative sites and 100,000 dispatches annually. Each fire station has a Zilog, Inc. Z80 microprocessor connected to the host computer via a 2,400 bit/sec asynchronous modem to provide multiple switching and monitoring functions, as well as to serve as an interface to the Digital Equipment Corp. VT100 CRT terminal and Epson America, Inc. printer in each station.

Two Levels of Backups

To ensure reliable operations continuously, three DEC PDP-11/44s are used, each of which is capable of operating the total system. This provides two levels of backup instead of one.

The system, which costs $5.2 million and took 19 months to construct and implement, has approximately 250 microprocessors, all interacting with each other, and incorporates 225 fixed and mobile digital CRT terminals on-line 24 hours a day, seven days a week.

Each of the 12 custom dispatch consoles houses two 15-in. high-resolution color CRT terminals and has a 20-radio-channel control system that is fully microprocessor controlled and is fully redundant. Graphics are used for various applications such as charts, graphs, maps and building plans. The system can also print graphics in color, a department spokesman said.

Each console in the communications center can receive and process calls for service. Every call for fire and other emergency service is screened to determine the correct type of response required. After this initial screening, information about the emergency, referred to as an incident, is entered into the system by the console operator, a department spokesman said.

The system verifies the address, logs a record of the incident and prompts the dispatcher to obtain any missing information needed. The system will provide equipment recommendations and status information to assist the dispatcher in making his final decisions on what equipment and personnel to send to handle the emergency.

Once the dispatch decisions are final, equipment assignments are transmitted automatically to the field over dedicated data and voice telecommunications circuits and data and voice radio communications links.

Fire fighters and paramedics in the field receive the dispatch data on their CRT terminals and printers at their stations. Data on the emergency is simultaneously displayed on the mobile digital terminals in their vehicles.

Updates on the status of personnel, equipment and the emergency is transmitted via the mobile digital terminals to all units assigned to the incident. Communications center personnel use a geographic file to establish the exact location of the emergencies.

(Continued on SR/48)

LASER PRINTING.

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On the right you're looking at sample output from our IMPRINT-10™.

If you're considering a local laser printer, we can deliver, at an unmatched price and performance level.

Practical Applications

The IMPRINT-10 provides line printer speed, daisy wheel quality, plotter graphics capability and typesetter font flexibility.

In the office, it's producing reports and internal documents at higher speeds and with substantially less noise than other printing devices. In data processing, it's delivering higher quality output than line printers in convenient 8½" x 11" page size. IMPRINT-10's allow graphic plotter users to merge high quality graphics with high quality text. Graphic arts applications include proofing for typesetting and demand publishing.

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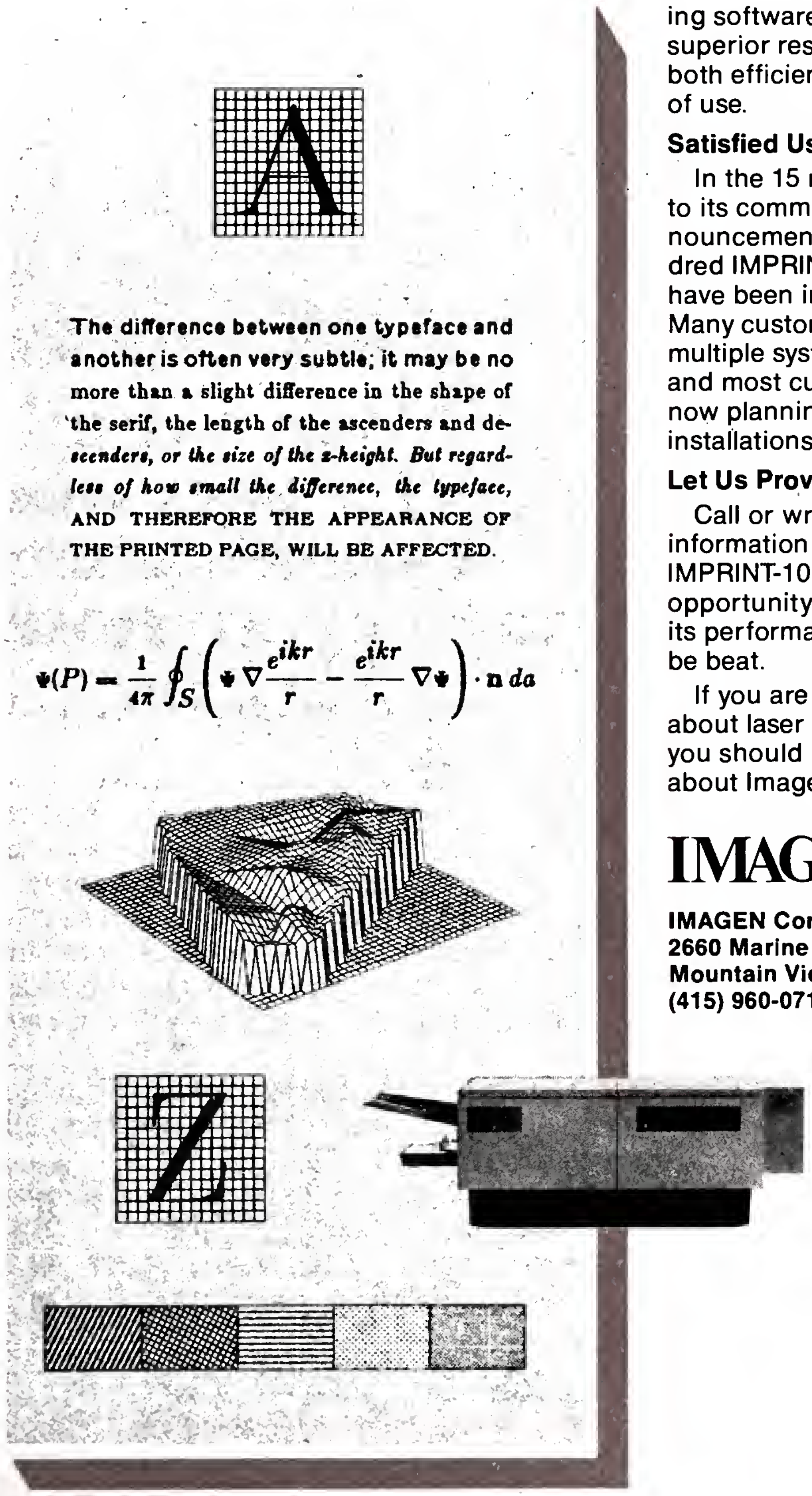
The IMPRINT-10 uses a proven electrophotographic marking engine that has provided reliable service to thousands. Exceptional software is the key to IMPRINT-10 versatility. After years of development at a leading university, Imagen's proprietary image processing software produces superior results with both efficiency and ease of use.



The difference between one typeface and another is often very subtle; it may be no more than a slight difference in the shape of the serif, the length of the ascenders and descenders, or the size of the x-height. But regardless of how small the difference, the typeface, AND THEREFORE THE APPEARANCE OF THE PRINTED PAGE, WILL BE AFFECTED.

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Satisfied Users

In the 15 months prior to its commercial announcement over a hundred IMPRINT-10 systems have been in field use. Many customers have multiple systems installed and most customers are now planning future installations.

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Irrigation Salesmen Above Water With System

(Continued from SR/46)

The sales people carry terminals, like briefcases, into the farmer's home or office and then ask the farmer a series of standard what-if questions. The questions relate to, among other things, pipe lengths and diameters required, water supply used, terrain characteristics and energy sources available to the farmer.

The sales people then type the information on the 745's keyboard, sending it directly to the host over commercial phone lines. Within 15 minutes, the terminal receives and prints out a computer-generated analysis with comparisons showing which of several Valmont or competitive systems would be the most energy-efficient and least costly for any particular farming operation.

Before the data terminals were acquired, the salesman analyzed the customer's needs by using a calculator and writing out long and complicated mathematical formulas while the farmer waited. This analysis took four to five hours, compared with the 15 minutes consumed with the present modus operandi, according to a spokesman for Valmont.

The host system runs about 40 programs that cover all technical and financial aspects of irrigated farming, the output of which is accessible via the remote terminals, the Valmont spokesman said.

Valcom also has a message system whereby each Valcom user has a numbered file recorded with the host system.

To communicate with a field employee, Valmont headquarters records a message in the employee's numbered file. When the employee calls in his number at the end of the day via the terminal, he automatically receives a copy of the message.

System Aids Department

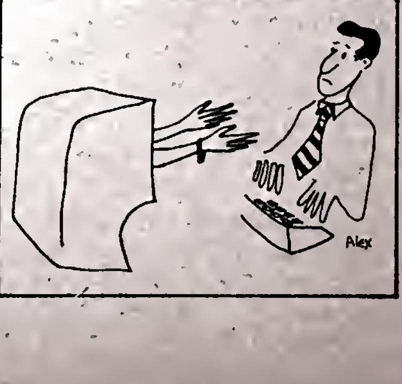
(Continued from SR/47)

The file provides information on specific buildings involved in the incident and on any hazardous conditions. The file also detects possible duplicate calls and alerts the operators, a spokesman said.

The mobile digital terminal subsystem itself is integrated with the dispatch system. The dispatcher at the communications center does not need to say or do anything in response to status messages being entered into the system. This reduces radio congestion and provides more accurate status keeping and reduced work loads for the dispatchers.

Administrative sites in the three departments are equipped with color video terminals and printers, which allow them to monitor departments activities and to carry out administrative functions such as maintaining personnel files, rosters and schedules, updating the various files, developing research statistics on emergencies and administrative message distribution.

The mobile digital terminal subsystem reportedly improves the reliability and speed of unit status reporting, making command operations more effective, and it allows fire units to communicate rapidly with all other system users, the department spokesman said.



Why install cables for data when there's a network… right under your nose? If you're tired of the endless hassle of expanding your local area network—not to mention the expense of installing cable and limited distance modems—Teltone has some very good news for you.

It's called the DCS-2 Data Carrier System, and it lets you use existing PABX wires to carry both voice and data traffic *simultaneously.*

That's right. Up to 9600 BPS of dedicated-channel, full duplex asynchronous data can be transmitted or received by any ASCII terminal in your system—and the data won't interrupt phone service.

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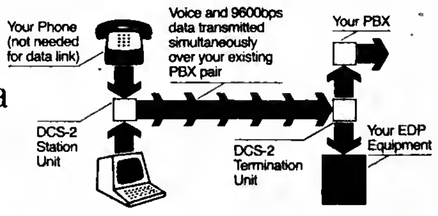
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Firm Sticks With System to Trace Explosives

TAMAQUA, Pa. — A series of squat brick buildings surrounded by dirt bunkers lies secluded here in the mountains. The bunkers and remote mountainous terrain are ideal for the thousands of pounds of explosives stored in these magazines.

Such precautions are an everyday fact of life for Atlas Powder Co. and have been since the firm's beginning in 1912. In 1978, Atlas added another precaution: Each of the dynamite magazines has a CRT terminal linked to the company's computer center in Dallas.

These terminals help the firm control every stick of dynamite from manufacturer to customer. Getting the right product to customers at the right time with minimal handling is critical to Atlas. In addition to the Tamaqua location, the magazines covered by the terminals are scattered in such out of the way places as Joplin, Miss.; and Baxter Springs, Kan.

One reason for this extraordinary tracing procedure is that the U.S. Bureau of Alcohol, Tobacco and Firearms requires it. But an even better incentive, according to Atlas' director of data processing, Dan Johnston, is that Atlas' survival depends on it. "Safety is the number one corporate goal," he said.

Tracing every stick of dynamite to the site of its final use is not easy. In fact, Johnston said, "It's next to impossible without computers. Other methods can get close, but close isn't good enough." The traditional method of controlling explosives at the storage level is to keep a written log for each door of the magazine. When explosives are stored or removed, someone updates the log. Atlas' computer network not only provides a more dynamic and accurate accounting of explosives, it also enables the company to keep centralized records. When company officials or the Bureau of Alcohol, Tobacco and Firearms ask how many explosives Atlas has in its magazines scattered over several states, the answer can be instantly in hand.

Exercising another form of safety, Atlas chose a Codex Corp. processor to supply and maintain all the equipment in its data communications network — from front-end processors to remote terminals.

In Dallas, the IBM 4341 mainframe interfaces to Codex's 6520 front-end processor. Codex 6000 series intelligent network processors statistically multiplex the terminal traffic in the network to save on leased-line costs. The eight locations and associated terminals on-line to the CPU are multiplexed to two lines terminating in the front end. In case these leased lines go down, four dial back-up lines are available.

The multiplexed traffic on the phone line then passes through another set of multiplexers in Tamaqua and Joplin. But if the dial backup lines are used, an A/B switch configured by Codex can switch in a digital line-sharing device to bypass the multiplexer. CRT terminals and printers connect to this set of switches either directly or with modems over local phone lines. Additionally, the Frankfurt and Baxter Springs terminals tie to the multiplexers via long-distance phone lines.

Most Important Factor

Probably the most important network factor for Johnston is service. He cannot afford a system that does not work — and not only because high explosives are involved. "Payroll is a very critical system," he said.

Johnston recalled that one manufacturer's proposal to meet Atlas' communications needs did not meet the reliability requirements, confirming the emphasis on solid network design expertise. "They proposed a multidrop configuration, but if one terminal takes a hit on a system like that or a line breaks, you're down." The Atlas network is not subject to such limitation. "There is virtualy no way the net can fail," Johnston said, "unless the host computer or front-end processor fails."

Backup is one key to the network's reliability. Should any of the system's leased phone lines go down, the dial backup facilities come into play. Several Codex LSI-6 modems help accommodate slower backup lines by automatically switching from their normal 9,600 bit/sec transmission rate to 4,800 bit/sec. And T-bar relays can reroute traffic around any failed node. These provisions work well and help keep costs down.

The multiplexers have improved Atlas' terminal response time by about 60% compared to the multidrop approach. The 6030's polling method permits typical full-screen terminal response times of about four seconds, which increases to only eight seconds in the worst case when all terminals are in use. In contrast, terminals on Atlas' old multidrop net took six seconds to respond at best, and when all the terminals were in use, they took up to 22 seconds to respond.

These response-time improvements are important, Johnston said, because they equate to a productivity increase for the people who use the system. A system that responds 60% faster doesn't necessarily boost productivity 60%, but, in Johnston's case, the improvement is significant.

Integrated Office Systems Opportunities

As innovators in telecommunications, we at Northern Telecom Inc. have pioneered many revolutionary communications systems. We currently have a need for the following key individuals to put their experience to work for us in helping pioneer even more sophisticated systems for the integrated office.

Manager, Systems Requirements

This key manager must establish detailed product specifications to meet market requirements while working with Product Managers in Voice, Data, Network and Information Services to integrate service and feature requirements. This person will also work closely with development engineering, market managers, and other product managers to see that the final requirements are competitive and achieveable.

This position involves considerable decision-making and self direction and requires at least six or more years of experience in the telecommunications, data communications or distributed data processing industry in development, engineering and marketing areas. A strong technical background in both hardware and software is preferred. A Bachelor's degree in engineering or computer science is also required with an advanced degree desired.

Senior Product Specialist

A unique combination of technical and marketing skills is required in this position in order to coordinate activities on the Omnifacts product in the sales, materials acquisition and software/manufacturing areas. Omnifacts is an auxiliary computer product providing Management Reporting on value added services for SL-1 customers.

Responsibilities will include in-plant presentations and demonstrations, and handling inquiries regarding the product. Planning efforts to expand product capabilities will also be required along with keeping a current and accurate documentation of this product's growth.

At least 5 years of product related experience is required with a Bachelor's degree in Science, Engineering or Computer Science preferred. A knowledge of PBX products is essential for this position as well as familiarity with computers, computer products and computer programming. Excellent oral and written communication skills are also required.

Don't miss this opportunity to get in on an industry that's going places and a company that's leading the way. Please send your letter/resume to

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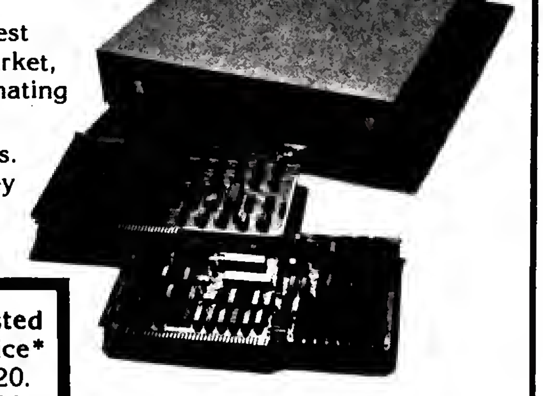

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20	$ 9,620.
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Chevron Routes Freight With Terminal Net

SAN FRANCISCO — To alleviate its freight rating and routing information problems and to help meet the challenges of deregulation, Chevron Chemical Co. here instituted an on-line freight rating and routing system.

McDonnell Douglass Automation Co.'s McAuto Freight II has greatly simplified and streamlined Chevron's rate maintenance operation and has provided people in marketing, manufacturing, distribution and traffic with more control over freight activities.

Chevron, the largest nonpetroleum subsidiary of Standard Oil Co. of California, realized it had a significant problem maintaining freight rating and routing information in an efficient, cost-effective manner.

Every time the traffic department received a rate quotation request, the tariff analyst had to delve into tariff after tariff of complex freight rates to find out which ones applied and to determine the correct charges. This often took a full day including research work.

Rapidly changing tariff structures complicated the matter even further, frequently resulting in incorrect freight bills. Typically, this meant an overcharge to the shipper.

By law, Chevron had to pay the carrier in seven days, but was not refunded the overcharge until 1½ years later, due to the extensive backlog of bills that its traffic department had to audit manually. As a result, Chevron lost thousands of dollars in interest that it should have been earning on the overpaid amount.

McAuto Freight II centralizes rate and route data, speeds and simplifies the process of updating information, enables rate changes to be made in minutes, makes data accessible to all authorized users in seconds, ensures that the proper rate and charges are applied and reduces the need for manual rate and route guides.

Chevron produces industrial and agricultural products. In order to load data to cover this extensive product line, McDonnell worked with Chevron in devising a logical and strategic plan.

The company began with its Ortho Fertilizer Division, which was loaded region by region, starting with Dallas. This division develops fertilizer products that meet a wide variety of soil and crop needs. This fertilizer is shipped in bulk in trucks with a 20- to 25-ton minimum weight per truck or by rails with a 100-ton minimum weight per rail car.

The company's Petrochemicals and Oronite Additives Divisions were completed next. The Petrochemicals Division produces and markets "building block" chemicals.

The Oronite Additives Division is a major manufacturer, developer and supplier of petroleum additives. Oronite Additives improve the performance of engine types. Both the petrochemical products and additives are transported in trucks with a 22-ton minimum weight per truck or by rail with a 100-ton minimum weight per car.

Chevron selected McAuto Freight over other rating and routing systems because it offered the company what it needed to control its large volume of shipments subjected to ever-changing rate and carrier conditions.

"McAuto Freight provides ready access to past and up-to-the-minute rail, truck route and rate data bases — allowing personnel in marketing, distribution, manufacturing and traffic to retrieve rates and routes directly from the computer," said Cal Allen, manager of traffic at Chevron.

System Speeds Auditing

"The system also speeds up our freight bill auditing considerably. Now we're able to audit a freight bill in just two minutes on the average, as opposed to one hour to one day without the system," Allen continued.

Information for McAuto Freight is kept up to date through the use of CRT terminals which connect to the system. Chevron has terminals at 20 locations across the country, connecting to an IBM 3033 mainframe computer with the OS/MVS operating system and IBM's Information Management System.

Through a terminal in Chevron's San Francisco office, commands are keyed in by the traffic analyst to add, delete or update information. This data then is transmitted directly to the computer. Once entered, the requested command is completed and the new information is immediately available to any authorized user.

Inquiries regarding rate data include point-to-point and mileage rates by origin, rates destination and product.

Chevron now is considering purchasing a new on-line, interactive system called McAuto Freight Bill Audit which allows shippers to simplify greatly the approval, payment and auditing of freight bills automatically.

Whisper Writer 1000 communicates via phone lines at 300 baud, TWX at 110 baud, and Telex at a proprietary 110-baud/66-wpm rate.

The remarkable new Whisper Writer, from 3M.

Data communications, TWX, and Telex. All in one compact machine, at an astonishingly low price.

Make a modest investment in 3M's new Whisper Writer 1000, and you'll be able to communicate with your own mainframe computer, a DDP network, or a time-sharing service. You'll also have the ability to send and receive messages by TWX, Telex, phone lines, or electronic message center, along with transmission to 3M's 9600 Facsimile Transceiver. In short, you'll be getting both a desktop communications terminal *and* a portable DP terminal for less than the cost of most single-purpose machines.

In its standard configuration, the Whisper Writer comes with an internal modem, telephone jack, and programmable automatic answering feature. Options include a carrying case with acoustic coupler and an automatic line selector that lets you leave your Whisper Writer connected to both a telephone and a TWX line. A special version is available with an RS-232 interface in place of the standard modem for direct hookup to a computer, external modem, or CRT terminal.

When ordering any Whisper Writer, you can specify either a 40-column or 80-column printer. The unusually quiet thermal printing mechanism prints sharp, black-on-white characters at 40 cps and is able to produce graphics under the control of a compatible computer.

Editing memory lets you prepare text off-line.
Whisper Writer's four-page dynamic memory and editing features allow you to get messages and data letter-perfect before you dial. The result: lower phone, TWX, and Telex charges, along with less tying up of communications lines.

Easy to learn, simple to use.
The separate keyboard module in the Whisper Writer 1000 has a conventional typewriter layout. Additional function keys reduce the need for memorizing special control codes.

Also available as a low-cost RO teleprinter.
Whisper Writer can be ordered without a keyboard as a modem-equipped or RS-232-compatible, 40-column or 80-column printer. To add a keyboard later, merely buy the separate module and plug it in.

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Whisper Writer's dot-matrix printer has already demonstrated its durability in more than 55,000 home and small business computer systems. Whenever maintenance is required, it's available from the same people who market and service 3M business products nationwide.

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Vendors Underestimate Demand

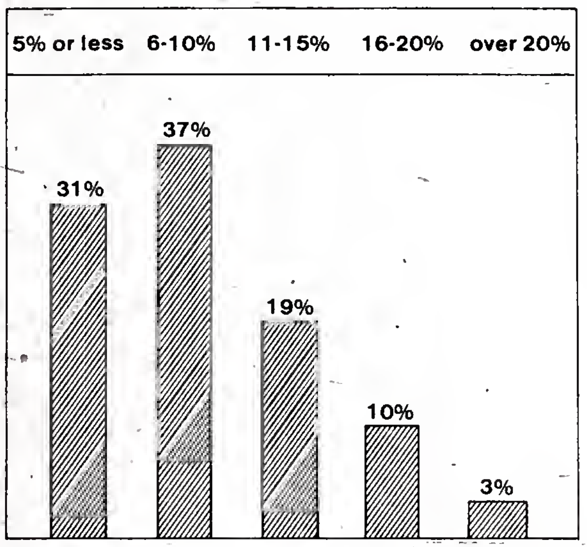
Users Would Pay for Diagnostics: Study

By Susan Blakeney
CW Staff

ST. LOUIS — Electronics product manufacturers are significantly underestimating the premium prices that users are willing to pay for new products that include self-diagnostic and remote-diagnostic features, according to Burt Mendelson of Westfield Associates here.

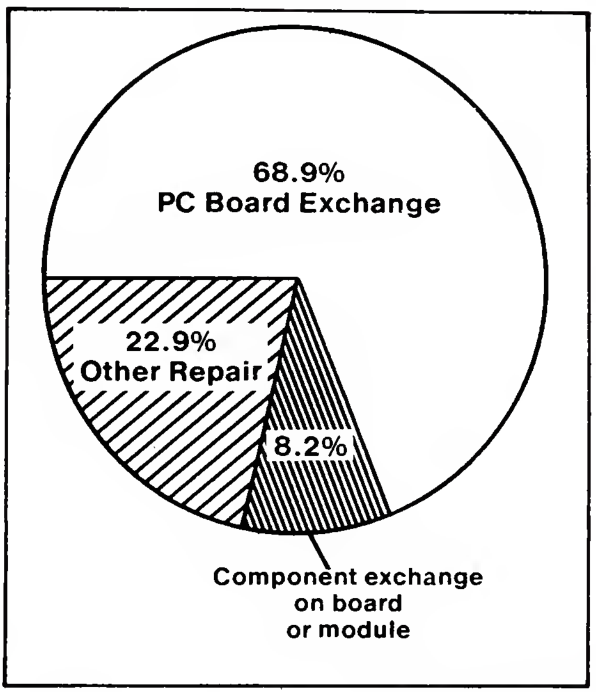
Mendelson based this statement on research conducted by his company and reported in "Tele-Maintenance Study." In the study, he predicts that self-diagnostic features will command only a 5% to 7% premium, whereas the bulk of the users expressed a willingness to pay as much as 10%.

Mendelson discussed some of the study's findings at the recent national conference of the Association of Field Service Managers in Houston. Mendelson pointed out that "remote diagnostics" means different things to different people: It is thought of as a technical concept, an effective sales tool, a practical necessity or a way of life. "Remote diagnostics is more than the technology on which it is based and less than a way of life. It is something in between which will become more prevalent in the next five years, and maybe even begin to be taken for granted," he theorized.



Westfield Associates Chart

Figure 1. Seventy-nine percent of the respondents said 'yes' when Westfield Associates asked users, 'Should vendors provide more built-in diagnostics?' For that 79%, the chart shows the percent increase in the cost of product justified.



Westfield Associates Chart

Figure 2. On-Site Customer Service by Board Exchange or Other Means

The level of self-diagnostics or remote diagnostics that manufacturers wish to build into the product, according to Mendelson, is the area that must receive the most attention in the design stage. "The economics of remote diagnostics is something like 'supply side' economics: You have to believe that an investment in an improved product design for easier field service will return more dollars to you in service cost savings than the dollars you invest," he said.

Mendelson recommended the follow-

(Continued on Page 58)

Tandy Adds Business System, 12M-Byte Disk to TRS-80 Line

FORT WORTH, Texas — Tandy Corp. has extended its TRS-80 series with an 8-bit, business-oriented system as well as a compatible 12M-byte hard disk drive.

Designed to handle applications requiring large information files such as accounting, inventory control and medical records, the TRS-80 Model 12 is available in either a single-disk version, priced at $3,199, or in a two-disk model costing $3,999. The system is reportedly compatible with all existing TRS-80 Model II software, which includes more than 50 vendor-supported packages.

The Z80A-based system's basic configuration is made up of 80K bytes of memory, a built-in 1.25 M-byte drive (a second 1.25 M-byte drive can be added), an enhanced version of the company's TRSDOS 2.0 disk operating system called TRSDOS 4.2 that supports double-density, double-sided floppy disks, a 12-in. green phosphor monitor, a detachable keyboard that features eight function keys, two RS-232 serial ports and an external disk bay port that

(Continued on Page 59)

Memory Prices Cut on DPS 6 Minis

WALTHAM, Mass. — Honeywell, Inc. has announced memory price cuts of up to 57% on its DPS 6 minicomputers, along with price reductions of up to 83% for related annual maintenance. In addition, the firm announced increased memory capacities on certain DPS 6 models.

Memory expansions using 64K random-access memory technology are now priced at $12,000 for a 1M-byte module, down from $28,000/M byte, the vendor explained. At the same time, the company unveiled a 64K-chip expansion board for its DPS 6/54 and 6/74 computers, thereby increasing the maximum memory capacity from 1M byte to 2M bytes.

Annual maintenance prices on 64K-chip memory expansion have also reportedly been reduced from $3,112 to $500/M byte, the vendor said. Price cuts are effective immediately. Further details may be obtained from Honeywell, Inc., 200 Smith St., Waltham, Mass. 02154.

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Vendors Underestimate Diagnostic Prices: Study

(Continued from Page 57)

ing checklist of questions to help manufacturers make decisions regarding a machine's diagnostics capabilities:

- Will it reduce the time needed to complete a service call?
- Will it assist the operator in identifying problems?
- Will it help the service person accurately pinpoint failures?
- Will it permit a remote diagnostics center to pinpoint failures?
- Will it reduce your spare-parts inventory of boards and components?
- Will it make the customers happier with your service?
- Will it help sell the customer a maintenance contract?
- Will it help sell the product itself?
- Will it encourage the customer to do his own board mapping — assuming you want him to do that?
- Will it help offer an extended warranty if the customer wants it?

In enumerating the possible benefits in remote and self-diagnostic capabilities, Mendelson produced a number of statistics from his company's research, as well as from various vendor and user group studies, to claim that 71.5% of the manufacturers surveyed considered their field service activity a profit center, while only 11.5% called it a cost center. The remaining 17% indicated that it was an overhead/budgeted type of operation. Sixty-six percent of those surveyed placed a high value on remote diagnostics to reduce the time needed to complete a service call, with 26% giving a medium rating and 8% assigning it a low priority rating.

Mendelson said the hourly rates for field service during regular working hours ran between $25 and $200; during overtime, these rates leaped from $40/hour to $300/hour.

"Remote diagnostics isn't necessarily going to get your department higher up the ladder," he said, "but it may give you an opportunity to get more visibility with engineering and other key departments as well as your management.

"If you are not already a profit center and it makes sense for you to be one, talk to your boss . . . If you are a profit center and your boss wants higher profits, try to show him that if you can properly influence the product design, you can make more profits," he advised.

Westfield Associates' study costs $2,500 from the company at Suite B, 787 Cross Creek Drive, St. Louis, Mo. 63141.

System Performs Video Graphics

CUPERTINO, Calif. — Via Video, Inc. has announced System One, a turnkey microprocessor-based video graphics system for firms with advertising, broadcast and cable TV applications.

The system features real-time animation, stop frame animation, color map animation, unlimited fonts, full color slide and transparency production capabilities and direct output to red, green, blue devices, the vendor said.

The system can also handle video output in accord with the National Television Standards Committee, the vendor said.

System One can emulate pens, rulers, brushes, rubber stands, animation stands, digital effects generators and character generators. The unit can also combine effects in unique ways, according to a spokesman for the vendor.

Systems cost from about $45,000. Via Video is headquartered at 10115 S. DeAnza Blvd., Cupertino, Calif. 95014.

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For Storage of Microfilmed Documents

Kodak Unveils Mini-Based Info System

ROCHESTER, N.Y. — Eastman Kodak Co. has announced a minicomputer-based information system for the storage and retrieval of microfilmed documents.

Called the KAR-4000, the system was designed for users with transaction-type applications who typically process from 1,000 to 7,000 documents a day or make 25 or more retrievals of such information, Kodak said.

The system can access on-line data and source documents from up to eight terminals and can operate either stand-alone or can be hooked up to a host computer in a distributed mode.

The company said that the KAR-4000 in its basic configuration consists of an Applied Digital Data Systems, Inc. (Adds) Mentor minicomputer with 128K bytes of memory, a Kodak IMT-150 microimage terminal, two Adds CRT display terminals, a 30M-byte Winchester disk drive and Acctex Corp. software. It can also support a Printronix printer, Kodak added.

Six different models of the system are offered ranging in memory from 30M bytes to 120M bytes. The 400 series will support up to four CRTs, and the 800 series will support up to eight CRTs. Kodak said that full hardware and software support is available.

Prices for the systems, which are available immediately, start at $70,000.

More information can be obtained from Eastman Kodak Co., 343 State St., Rochester, N.Y. 14650.

TRS-80 Series Enhanced

(Continued from Page 57)

allows printers, plotters and modems to be connected.

An optional card cage containing six additional plug-in slots to accommodate additional expansion boards is also available, a spokesman noted. Plug-compatible expansion boards include a Visicalc memory board that reportedly increases memory capacity to 144K bytes, a high-resolution graphics board, a Model 16 upgrade board that provides the Model 12 with 16/32 bit processing power and increases memory up to 512K bytes.

The new 12M-byte hard disk drive provides increased data storage capacity and offers faster access time through its Winchester technology. Intended for large inventory control needs, accounting and data base management systems, the unit's disk is compatible with Tandy's Model II, Model 16 and Model 12 software.

The 5¼-in. drive has three platters that use sealed media with a self-contained, recirculating filtered air system, Tandy said. Each of the six disk surfaces has one movable read-write head to access each disk's 230 data tracks.

The 12M-byte primary drive costs $3,495, while the secondary drive lists for $2,495. Tandy Corp. is located at 1800 One Tandy Center, Fort Worth, Texas 76102.

Semi Disk Cache Introduced

IRVINE, Calif. — A semiconductor disk cache has been introduced by Point 4 Data Corp.

The Lotus Cache Memory (LCM) consists of one or more printed circuit boards, each of which carries up to 1M-byte random-access memory (RAM). The LCM can be installed in Point 4's Mark 5 or Mark 8 or in other compatible computers such as Data General Corp.'s Nova 3 or 4.

The disk cache stands in the memory hierarchy between the CPU RAM and the user's disk system. In use, the most frequently used data and programs can be accessed reportedly without any of the delays associated with disk access.

Priced between $3,490 and $7,300, the boards are available from Point 4, 2569 McCabe Way, Irvine, Calif. 92714.

BTI Mark II Version Of 5000 Minis Out

SUNNYVALE, Calif. — BTI Computer Systems has unveiled a Mark II version of its 5000 16-bit multiuser minicomputer, which BTI said is 50% faster than its current models.

BTI is also offering a field-installable Mark II Upgrade Kit. Upgrades are said to be completely transparent to application software.

The Mark II costs $38,950, the Upgrade Kit costs $5,000, from 870 W. Maude Ave., Sunnyvale, Calif. 94086.

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By using CYX to build the Fully Integrated Reservation System for Travel (FIRST), Tymshare, Inc. cut months out of their production schedule — time that would have been spent developing their own untested transaction processing system.

Union Carbide's new Material Acquisitions Data Processing System is relying on CYX to economically distribute transaction processing capabilities to chemical plants across the country.

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Laser Printer Out For IBM Systems

TUSTIN, Calif. — General Business Technology, Inc. (GBT) has announced a laser printer for IBM System/34 and System/38 computers that is based around the Xerox Corp. 2700 electronic printer.

The GBT 6600XP interfaces with the host computer through a standard twin axial cable. It functions as a workstation printer without any software additions or modifications, GBT said.

For remote applications, the laser printer may be connected to the computer via an IBM 5251-12 display station. It costs $26,000, GBT said from 2630 Walnut Ave., Tustin, Calif. 92680.

Works With Apple II

Diskette Duplicating System Unveiled

SCOTTS VALLEY, Calif. — A diskette duplicating system said to be twice as fast as competitive duplicators at half the price has been unveiled by Mountain Computer, Inc.

The Floppycat 3200 reportedly initializes, copies and verifies up to 100 5¼-in. floppy diskette/hour, twice the duplication rate of other copiers. The Model 3200, in conjunction with the user's Apple Computer, Inc. Apple II computer and floppy disk drive, will copy Apple-compatible 13- or 16-sector diskettes.

The system's I/O hopper can hold up to 50 diskettes, which are copied from an unprotected master diskette. It automatically sorts out rejected copies, assuring the user of a steady supply of valid diskettes, the vendor explained. Once the hopper is loaded, it can run unattended, copying diskettes in 35 seconds. An optional 5M- or 10M-byte Mountain hard disk system can be used with the Floppycat for mass program storage applications such as cataloging and master files.

The duplicating system, including copier and software, costs $4,995. It will be available in April from Mountain Computer, 300 El Pueblo Road, Scotts Valley, Calif. 95066.

Z80A-Based Board Turns CRTs Into Personal Micros

SAN DIEGO — A Zilog, Inc. Z80A-based board that turns CRT terminals manufactured by Televideo Corp. and Lear Siegler, Inc. into personal computers has been announced by Data Systems Marketing.

The Microfit Instant Computer contains 64K bytes of random-access memory, two RS-232 ports, a Centronics, Inc. parallel interface and a floppy disk controller that can reportedly interface with either 5¼- or 8-in. disk drives. Up to four disk drives can be attached to the system, according to the vendor. Mass memory capacities range from 200K bytes to roughly 5M bytes.

The Microfit Instant Computer operates under Digital Research, Inc.'s CP/M operating system. It costs $1,450. Data Systems Marketing is based at 5710 Ruffin Road, San Diego, Calif. 92123.

HP Announces Speech Module

PALO ALTO, Calif. — Hewlett-Packard Co. has announced a speech-output module for its HP Series 80 line of microcomputers.

Called the HP 82967A, the unit comes complete with software for reviewing, editing and creating needed speech output. Software to run the module is provided on both a 5¼-in. and 3½-in. floppy disk, which can store up to 1,500 words. The module plugs into one of the four slots on the back of the Series 80 processor and is housed in the same basic package as the Series 80 modem, the vendor said.

The HP 82967A costs $375. More information is available from HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Disk Storage Systems Unveiled by Empak

CHANHASSEN, Minn. — Multiple and individual memory disk storage systems are available from Empak, Inc.

The PH66-52 Multiple Disk Storage Box stores up to 25 5¼-in. diameter disks in a stackable box with removable latch top and bottom. The box features a large label area for identification of contents.

The B20-52 Individual Disk Storage Package was designed for easy access and secure closure, according to a company spokesman. It stacks easily and has a tapeable perimeter, he said. The design features a center hub that suspends the disk, reportedly eliminating surface damage.

The PH66-52 costs $7/unit and the B20-52 costs $1.76.

Free product samples are available from the firm through P.O. Box 448, 1501 Park Road, Chanhassen, Minn. 55317.

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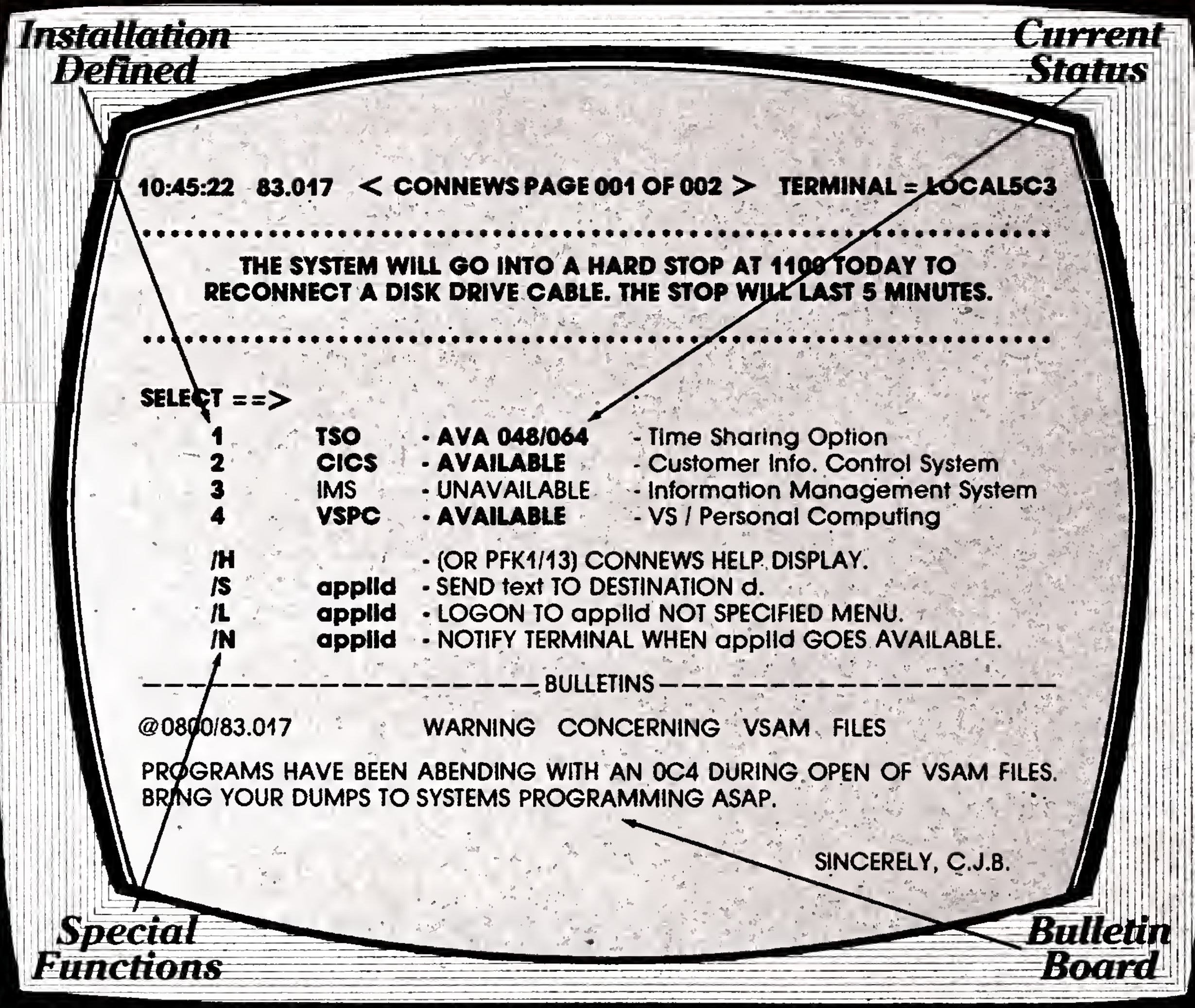

```
10:45:22  83.017  < CONNEWS PAGE 001 OF 002 >  TERMINAL = LOCAL5C3
..................................................................
     THE SYSTEM WILL GO INTO A HARD STOP AT 1100 TODAY TO
   RECONNECT A DISK DRIVE CABLE. THE STOP WILL LAST 5 MINUTES.
..................................................................
SELECT ==>
     1      TSO     - AVA 048/064    - Time Sharing Option
     2      CICS    - AVAILABLE      - Customer Info. Control System
     3      IMS     - UNAVAILABLE    - Information Management System
     4      VSPC    - AVAILABLE      - VS / Personal Computing

     /H             - (OR PFK1/13) CONNEWS HELP DISPLAY.
     /S     applid  - SEND text TO DESTINATION d.
     /L     applid  - LOGON TO applid NOT SPECIFIED MENU.
     /N     applid  - NOTIFY TERMINAL WHEN applid GOES AVAILABLE.
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@0800/83.017          WARNING  CONCERNING  VSAM  FILES
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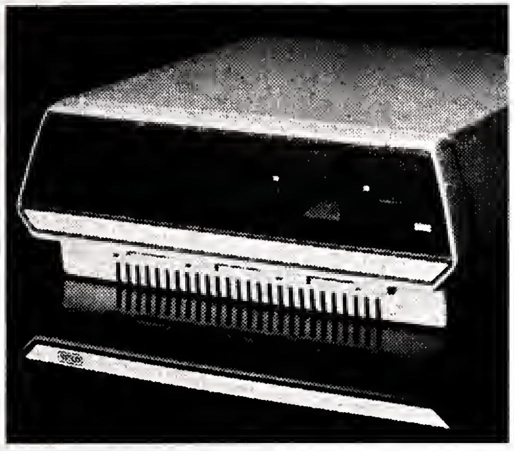
Business-Oriented System Offers Multiuser Capability

SAN JOSE, Calif. — Altos Computer Systems, Inc. has introduced a business-oriented, 8-bit system said to be capable of supporting three users simultaneously and featuring up to 10M bytes of storage capacity.

Priced at $6,490, the Model 580-10's standard configuration includes a Zilog, Inc. Z80 processor, a 192K-byte random-access memory chip and a 5¼-in. 10M-byte hard disk drive that accommodates double-sided, double-density 1M-byte floppy disks. The Digital Research, Inc. MP/M II multiuser operating system also comes standard with the system.

Explaining the advantages of the 580-10's multiuser capability, an Altos spokesman said users can share a data base and not have to maintain the same data base separately as they would with a single-user system.

The 580-10, like the vendor's Series 5, runs under the Digital Research CP/M, MP/M and Phase One Systems, Inc. Oasis operating systems. It is also compatible with the Altos Accountant WP and financial WP packages, which reportedly contains a user-friendly interface.



Altos' Model 580-10

Altos said it will continue to offer its Series 5-5D, a 5M-byte system priced at $5,490 and the Series 5-15D which lists for $2,990.

Turnkey Aids Manufacturing

SMITHTOWN, N.Y. — Gull Resource Management Systems, Inc. has announced an automated manufacturing and inventory control turnkey system.

Based on the Prime Computer Corp. 2250 processor, the system includes software to handle inventory, purchasing, work orders, job costing, accounts receivable, accounts payable, general ledger, payroll and sales. In addition, the system can perform jobs-in-progress tracking, actual costs and profit analysis by job, the vendor said.

A base system costs $75,000, the vendor said through P.O. Box 9400, 100 Parkway Drive S., Smithtown, N.Y. 11787.

Superset Offers CAD Option

SAN DIEGO — Superset, Inc. has announced the availability of a printed-circuit computer-aided design (CAD) option for its Portable Graphics Mainframe computer system.

Supercircuit runs on the Superset 48-bit virtual memory computer, which can drive more than 40 different output devices, according to the vendor. Its features include: autorouting of up to 400 integrated circuits (IC); ground/pole plating of unfilled areas; 31 board layers; 30-in. by 30-in. board; wire list; wire wrap tape generation; multiwire tape generation; drill tape; photoplotter tape; interactive schematics; load checking with data base; extensive IC data base; and numerically controlled drill tape.

This product costs $5,000, the vendor said from 11035 Roselle St., San Diego, Calif. 92121.

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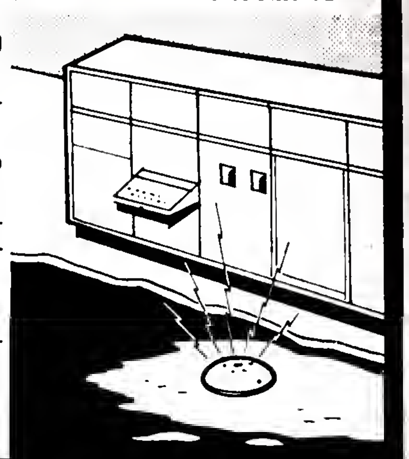

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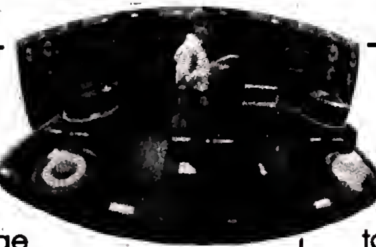

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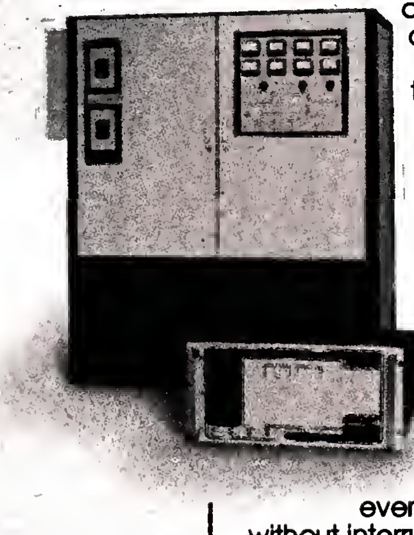

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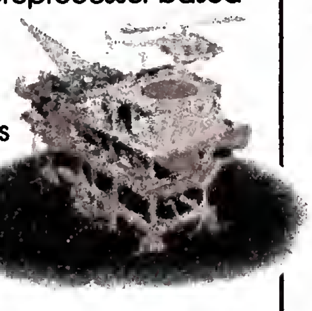

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Ups Graphics Speed

DG Adds Light Pen to Workstation

WESTBORO, Mass. — Data General Corp. has added a light pen option to its Dasher G300 graphics workstation that increases the speed and functionality of graphics applications.

The hand-held Model 6154 is intended for computer-aided design and manufacturing applications, page layout for typesetting or computer-aided instruction functions. It can be used to select items from menu options, eliminating the need for typed instructions. It can also be used to draw, the vendor said.

A Dasher G300 workstation with a light pen is priced at $4,300. A field-upgrade kit to add the light pen costs $1,000.

More information is available from DG at 4400 Computer Drive, Westboro, Mass. 01581.

Label Printer Provides Variable Info

ALLSTON, Mass. — Printer Products has unveiled a terminal/computer-driven 96-char. Ascii label printer said to provide variable information on labels.

The Model S400L dot matrix label printer is said to be capable of printing 50 char./sec up to 40 col. wide with 6 line/in. The system features positive sprocket feed, automatic self-test, positive label clamping and a printhead life expectancy of at least 15 million characters.

The software is available on virtually all applications, a Printer Products spokesman said. Interfaces include RS-232C, Centronics Data Computer Corp. parallel or 20 mA current loop, he added.

Available options include a 2K first in/first out buffer, form controls, custom colors and logos.

The printer costs $795. Delivery is available in 30 to 60 days, the Printer Products spokesman said from 24 Denby Road, Allston, Mass. 02134.

Gould Offers RS-232C Aid

SAN DIEGO — Gould, Inc. has announced a RS-232C status and diagnostic interface option for use with its line of uninterruptible power systems (UPS).

The Digital Information System (DIS) reportedly provides transmission rate-selectable RS-232C output of 56 internal UPS status and alarm functions in standard Ascii characters.

Users can elect to use the DIS in a number of ways: display UPS status on a terminal, monitor the status of a remotely installed UPS at a project headquarters site, have on-line diagnostic assistance provided by Gould's Service Headquarters or provide UPS status to its computer load to enable the computer to protect valuable data in the event of power loss, the vendor said.

The DIS option is available with any Gould 6000 Series UPS ordered for delivery as of Jan. 1, the vendor said.

It is priced at $1,500, the vendor said from 2727 Kurtz St., San Diego, Calif. 92110.

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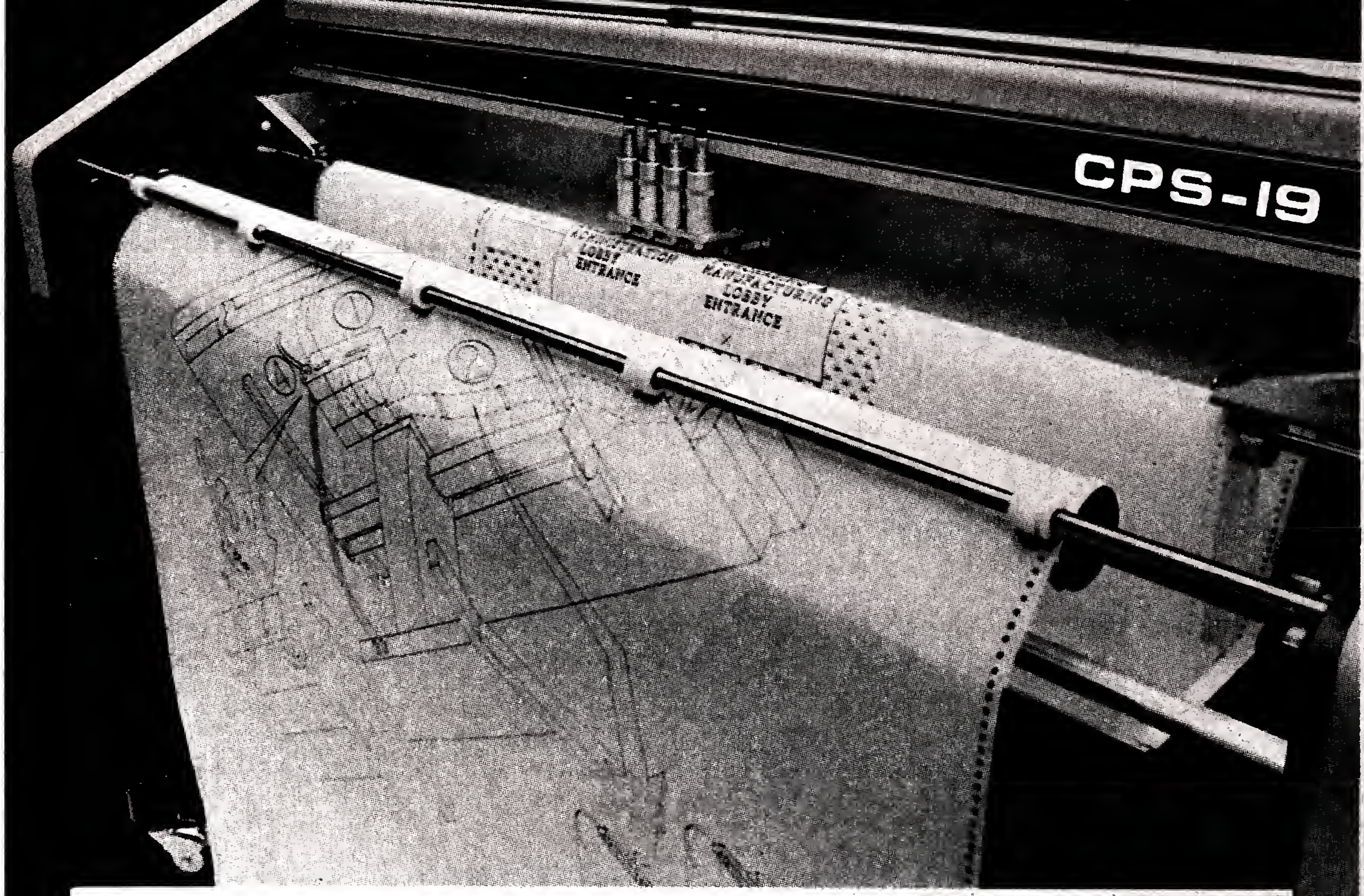

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For the name, address and phone number of your nearest representative, contact Houston Instrument, P.O. Box 15720, Austin, Texas 78761. (512)835-0900. Outside Texas call toll free 1-800-531-5205. In Europe, contact Houston Instrument, Rochesterlaan 6, 8240 Gistel, Belgium. Telephone 059/27-74-45.

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Bits & Pieces

CDC Comma Service Expanded to 3033s

MINNEAPOLIS — Control Data Corp.'s Engineering Services Division has expanded its Comma processor maintenance program to include IBM 3033 systems.

The expansion enables CDC to provide maintenance services as well as installation/deinstallation and relocation services for the entire 30 series.

The service is currently available in 73 U.S. cities and includes a network of parts warehouses, hardware and software maintenance libraries and consulting services.

CDC can be reached at Box O, Minneapolis, Minn. 55440.

Century Data Out With 14-In. Winnie

ANAHEIM, Calif. — Century Data Systems has announced a 513M-byte 14-in. Winchester disk drive that reportedly provides high-density storage capacity.

The Advanced Marksman Series 513 includes a basic drive, power supply and desktop enclosure.

Selectable dual access is available as an option, the vendor said.

The drive costs $11,400, Century said from 1270 N. Kraemer Blvd., Anaheim, Calif. 92806.

MSI Data Announces Bar Code Scanner

COSTA MESA, Calif. — MSI Data Corp. has announced the Datawand, a bar code scanning device said to offer 4,000 characters of memory.

The unit can read, decode, store and transmit bar-coded information independently of a data entry terminal. The unit is rechargable and can be used with any system incorporating an RS-232C interface, the vendor said.

The Datawand costs about $300, the vendor said from 340 Fischer Ave., Costa Mesa, Calif. 92626.

Graphics Unit Uses Mitsubishi CRT

LITTLETON, Mass. — Redac Interactive Graphics, Inc. has announced Cadet III, a color graphics terminal that uses a 19-in. Mitsubishi, Ltd. color raster CRT with a 512- by 512-pixel resolution.

The unit features eight user-defined colors, which can be assigned to various categories of data for clearer design representation and reduced operator fatigue, the vendor said. The unit was designed for computer-aided design and manufacturing applications.

The unit costs about $50,000 and the vendor can be reached through P.O. Box 7, Littleton, Mass. 01460.

Megatek's 'Template' Fits Genisco G-1000

COSTA MESA, Calif. — Additional software compatibility for the Genisco Computers Corp. G-1000 raster graphics terminal has been announced here by that company.

The 16-bit microprocessor-based terminal is now compatible with Megatek Corp.'s Template software.

The G-1000 is priced below $10,000, the vendor said from 3545 Cadillac Ave., Costa Mesa, Calif. 92626.

Imlac's Model 8000s Support CAD Tool

NEEDHAM, Mass. — Imlac Corp. has announced that its Model 8000 Series II Intelligent Computer Graphics terminals now support Easinet, a three-dimensional computer-aided design (CAD) package developed by Engineering and Scientific Computer Pty.

Easinet runs under Data General Corp.'s AOS and AOS/VS operating systems.

The product costs between $50,000 and $60,000. Imlac is located at 150 A St., Needham, Mass. 02194.

HP Plotter Module Links HP-41s to 7470s

PALO ALTO, Calif. — A plotter module to generate graphics and bar code with the Hewlett-Packard Co. HP-41 hand-held computer has been announced by the firm.

The plotter module reportedly allows users to link their hand-held computers to the HP 7470 color graphics plotter. The HP-41, with the plotter module, is connected to the HP 7470 graphics plotter via HP's Interface Loop.

The module costs $75 from HP at 3000 Hanover St., Palo Alto, Calif. 94304.

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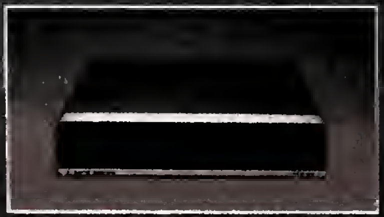

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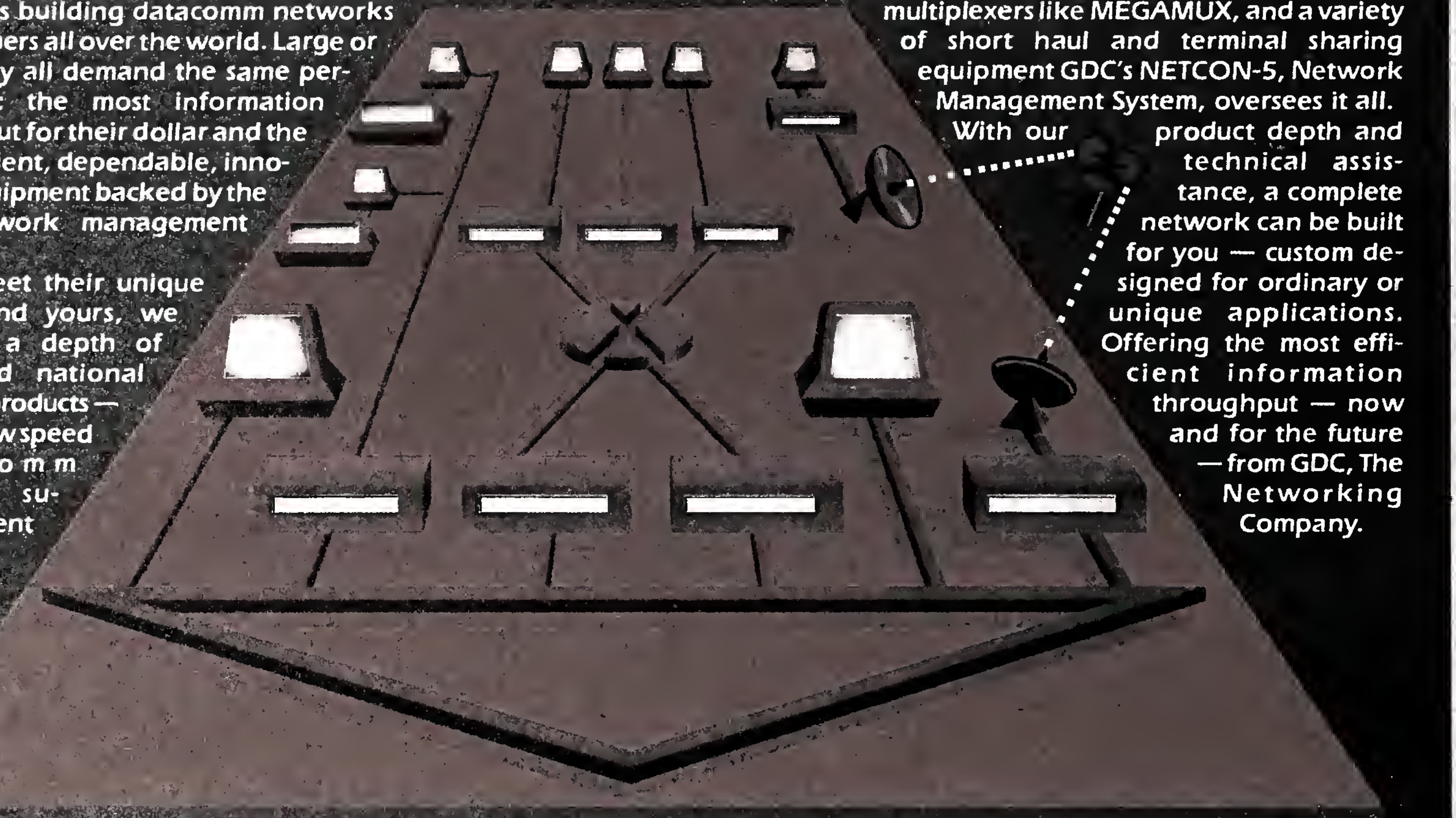

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NBI Boosts Oasys 64 Line, Cuts Oasys 8 Prices

BOULDER, Colo. — NBI, Inc. has introduced two clustered office automation systems to expand its Oasys line.

The Oasys 64-20 features 20M bytes of storage and the Oasys 64-30 features 30M bytes of storage. Both systems support eight peripheral devices and are upgradable to any large system in the Oasys 64 series, a vendor spokesman claimed.

The two systems are designed to fill the product gap between the company's Oasys 8 series and the Oasys 64-69. The Oasys 64-20 is available for $17,900; the Oasys 64-30 for $20,900.

The company has also announced price reductions for the Oasys 8 series with 2M bytes of storage from $11,900 to $9,900. All Oasys 8 configurations have been reduced by $2,000, a vendor spokesman said.

The Oasys 3000-S stand-alone system has been reduced in price from $7,400 to $6,900 and the NBI Docuwriter word processing system has been reduced from $5,400 to $4,900.

NBI can be reached through P.O. Box 9001, Boulder, Colo. 80301.

'Office-Mate/LP' Out for IBM CPUs

SCHAUMBURG, Ill. — National Systems Laboratories has introduced software for on-line list management and processing. The package is said to offer on-line terminal operation, security of data, automatic list management and the capability to print labels, envelopes and reports.

A menu-driven package with preformatted screens, Office-Mate/LP runs on an IBM 370, 4300, 30 series and compatible mainframes running under DOS/VS or OS/MVS with CICS.

A perpetual license for Office-Mate/LP costs $10,000 for DOS sites and $13,500 for OS sites. More information is available from National Systems Laboratories, 999 Plaza Drive, Schaumburg, Ill 60195.

Tests Designed to Gauge Job Applicants' Skill Levels

By Jim Bartimo
CW Staff

ROCKVILLE, Md. — Is there a surefire method of ensuring that employees hired to work on any given office system are as technically proficient as they claim to be? An office automation consulting firm based here believes the answer is emphatically "yes."

The firm has designed a set of tests to measure a job applicant's skill level on a particular type of equipment in the place of employment. There is a need for this type of testing, according to John L. Howard, president of Wordpro, Inc., because vendors are becoming less and less involved in training. "Regardless of what the vendor says about user-friendliness, [the equipment] is not any easier to use — especially if there are a lot of functions," he claimed.

The myriad of functions on many office systems is another reason Howard saw a need for testing. Because training by the vendor, or internally, is often lacking, the user often finds his own way to execute certain functions. These methods are often not the most efficient. "They don't want to admit that they didn't learn anything at the four-day training session," Howard said, "and if they call, the vendor doesn't know what he's talking about."

"Over the course of eight years, we had been doing a lot of implementation work," Howard said. "The people in needs assessment asked for some testing. I couldn't figure out why someone hadn't done this earlier."

So, Howard devised a set of two similar tests for each of 13 systems, including systems from NBI, Inc., Digital Equipment Corp., IBM and Wang Laboratories, Inc. The 25 questions take approximately 20 minutes to complete and are meant to be an indicator of skill, not aptitude, Howard pointed out.

For the $75 fee, the employer gets two different but equal versions of the test based on his type of equipment, and an answer sheet for correction. "It's not the ultimate answer," Howard continued, "you still have to check references" and follow other standard personnel procedures.

However, there is one area where the technical skills test is succeeding quite well on its own: "The temporary [employment] industry has gone crazy with it," Howard said.

Another office automation consultant said that testing is a positive step and agreed that it is not the ultimate answer. "Anything that gets people thinking more innovatively about hiring in the automated office is positive," according to Thomas Billadeau, president of The Office Systems Consulting Group, Inc. of Boston.

While a test may help an employer judge a candidate on his technical ability, other factors should be considered, he explained. A combination of a skill-aptitude that would test the potential of an employee to learn about a system would be ideal, Billadeau said.

"[Trained] word processing people are not out pounding on doors," he said, adding that such a aptitude test that also tests skill may prove to be even more successful as these trained people become increasingly difficult to find. As office systems become increasingly easier to use, a skill-aptitude test may help find potential candidates who are ideally suited for a particular job.

Interface Links IBM Micro to 3274

LOS ALTOS, Calif. — An interface board and associated software that reportedly allows owners of IBM Personal Computers to use coaxial cable to connect the machines to the IBM's Model 3274 and 3276 cluster controllers has been introduced by CXI, Inc.

Pcox is said to be transparent to IBM operating systems and access methods and enables the Personal Computer to emulate the Model 3278 and 3279 CRT terminals without requiring any host or application-software changes.

Pcox reportedly allows the micro to connect with any channel-attached 3274 or any remote 3274/6 operating either in binary synchronous control mode or Systems Network Architecture/Synchronous Data Link Control environments.

The interface board costs $910, with the accompanying keyboard/display handler, subroutine package and file transfer utility software available for an additional license fee of $285. CXI is based at 1300 Ensenada Way, Los Altos, Calif. 94022.

Contelnet Gets X.25 Interface Capability

GREAT NECK, N.Y. — Contel Information Systems, Inc. has introduced X.25 interface capability for its Contelnet local-area network.

The X.25 Domain software package is said to offer a bridge between the local-area network and an X.25 network; enable X.25 data terminal equipment to intercommunicate using X.25 levels two and three; and enable asynchronous teletypewriting devices to access X.25/X.29 data terminal equipment hosts, a vendor spokesman said.

The interface is available for $15,000 from Contel Information Systems, 130 Steamboat Road, Great Neck, N.Y. 11024.

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Best Performance in Recent Years

IBM Revenues Not Hurt by the Recession

By Bill Laberis
CW Staff

ARMONK, N.Y. — Despite a listless worldwide economy, IBM has reported bottom-line figures for 1982 that point to the company's best market performance in recent memory.

Revenues for the year ended Dec. 31 were reported last week at $34.4 billion, an 18% increase over 1981's $29 billion revenue figure. This is the largest percentage revenue gain since the mid-1960's, and reflects IBM's volume shipments of its high-end processors in the 3080 series, industry observers said.

Net earnings in 1982 rose 22% to $4.4 billion or $7.39 per share compared to $3.6 billion or $6.14 per share in 1981, once again making IBM's profits higher than the revenues of all but a few of its competitors. Reflecting a strong domestic performance, IBM's earnings from U.S. operations rose 34% over the previous year.

The earnings picture was enhanced by the company's adopting the Financial Accounting Standard Board's (FASB) so-called Rule 52, which added $449 million to shareholders' purses in 1982, half of that accruing in the fourth quarter alone. FASB 52 allowed IBM to record the effects of changes in foreign currency values relative to the U.S. dollar.

"It was an excellent year by anyone's standard," said Jack Hart, industry analyst for International Data Corp. (IDC). "I think they'll have to stretch it some to repeat this performance in 1983."

Hart said IBM's revenues increased "slightly more than we expected," terming both the revenue and earnings figures "remarkable when you consider the shape of the economy."

Both bottom-line figures — record highs for the company — were bolstered by IBM's aggressive pricing policies of 1982, designed to discourage rentals and to foster outright purchase of equipment, particularly high-end processors and disk drives, Hart said.

According to the company's figures, gross income generated by equipment sales increased 30% last year, while income from services jumped 20.6%. Rental income, however, increased only 2.6% for the year, and actually decreased 4.4% in the fourth quarter of 1982.

"That's a strategy that will continue into 1983 and beyond," said Harry Edelson, vice-president of research with the First Boston Corp., of IBM's aggressive equipment purchase policies

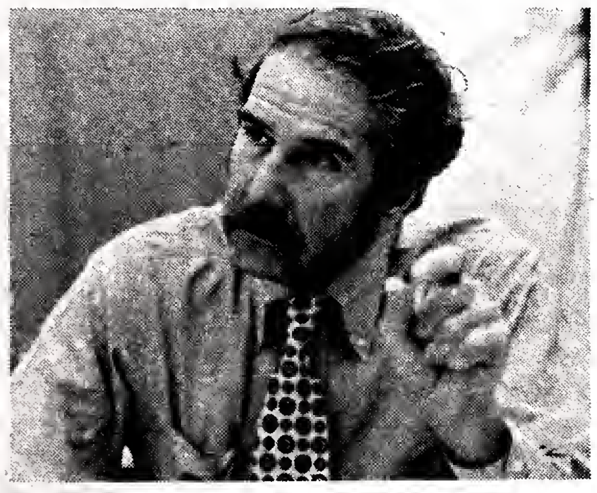
Edelson, unlike Hart, said he believes IBM can and will repeat its strong 1982 market performance in 1983. IBM benefitted by shipping its large processors during the most favorable part of the product cy-

(Continued on Page 68)

Sporck: National Semi Prefers Independence Over a Sellout

By Robert Batt
CW West Coast Bureau

SANTA CLARA, Calif. — National Semiconductor Corp. will not follow chip rival Intel Corp. in seeking a capital injection boost from a major mainframe vendor, Chief Executive Charles Sporck said here recently.



Charles E. Sporck

The company, which posted a loss of $3.5 million in the latest quarter, prefers to satisfy its capital requirements through asset management and thus maintain its independence, Sporck said.

"We think it is important for our customers that they have the security of a supplier unencumbered in terms of commitments to any one customer," he maintained.

A recently proposed deal between IBM and Intel will give IBM 6.25 million shares (a 12% minority interest) in Intel for $250 million. Some industry observers have speculated that the friendly agreement may forecast future deals between chip

(Continued on Page 68)

E. Floyd Kvamme, former president of National Advanced Systems, Inc. a wholly owned subsidiary of National Semiconductor Corp., recently resigned to become executive vice-president of marketing and sales for Apple Computer, Inc. He will be responsible for coordinating the marketing strategy for Apple's recently announced Lisa personal computer.

An exclusive interview with Kvamme, discussing his views and strategies on the computer industry begins on Page 69.

Teams With U.S., Japanese Firms

IBM Forms Japan Leasing Firm

By Tom Henkel
CW Staff

TOKYO — IBM has joined forces with Morgan Guaranty International Corp. and a Japanese leasing firm, Orient Leasing Co., to lease and offer creative financing here on all IBM systems.

The three firms formed a new company, tentatively called Japan Computer Leasing Co., which opened its doors early this month. An IBM spokesman said the new company will function much like the IBM Credit Corp. in the U.S., offering long-term leases and financing for virtually everything IBM makes.

IBM has a majority interest in the new firm, owning 36%. Oriental Leasing owns 35% of the firm and Morgan Guaranty has a 29% interest, IBM said.

(Continued on Page 72)

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National Semi Won't Follow Intel's Lead: Sporck

(Continued from Page 67)

manufacturers desperately searching for cash to finance the high cost of research and development and mainframe vendors dependent on semiconductor firms for vital components.

Sporck said that one of the problems with such a deal is that it may give a financial backer like IBM an undue influence over the supply of components.

"We would not want to solve our capital requirements through selling off a proportion of the company. We believe there are other ways to solve the problem, as, for example, in asset management where you manage your cash requirements in a more efficient way than your competitors," he asserted.

Capital alone is far from being the only ingredient in the success formula in the semiconductor industry, he said. "It's critical if you are a broad-based supplier to have customers that feel comfortable they are in an even position relative to their competition in terms of your support."

Looking to the immediate future, Sporck guessed that National Semi and other chip manufacturers would continue to turn in poor financial performances until there is a marked upturn in the economy. No amount of cost reductions or asset management will solve the problems on their own, he added.

Sporck predicted a modest increase in business performance in 1983 as inventories, built up last year on the false assumption there would be an economic recovery in 1982, are used up and order rates begin to approximate more closely the consumption of components. Then, he claimed, 1984 would see a great surge in demand for semiconductors.

"The chips are getting so powerful that, if you make one mistake too many, you can severely impact your place in the market, unlike in the past when development costs of one product were relatively modest and the size of the gamble was nowhere near as great as it is now," he said.

IBM's Bottom-Line Figures In '82 Soar Above Recession

(Continued from Page 67)

cle in 1982, "and this year IBM will shift into shipments of other models . . . the 3083 will take over from the 3081, and shipments will remain strong," Edelson commented.

IDC's Hart predicted that IBM will become the dominant revenue producer in the personal computer business in 1983. Both Hart and Edelson also predicted that the company will announce a high-end personal computer to compete with the likes of Apple Computer, Inc.'s recently unveiled Lisa personal business computer.

High-End 4300 Series CPU?

Edelson speculated further that IBM is destined to announce a high-end 4300 series processor, while Hart is looking for an announcement early this year of a system "that will penetrate the market the way the System/38 has not." Hart said he doesn't see the company "shipping any 4331s this year," and guessed further that IBM will find it hard to maintain shipments of high-end processors at its 1982 level.

"This points to the possiblilty of major product announcements which will come early in the year to allow for some shipments by year's end," Hart said.

IBM meanwhile also announced fourth quarter results, in which the company recorded record revenues and earnings. Earnings were pegged at $1.5 billion, or $2.50 per share, compared with $1.17 billion the same quarter a year before, a 30% gain. Revenues for the period were $11 billion, a 22% gain over the $8.9 billion posted the same quarter the previous year.

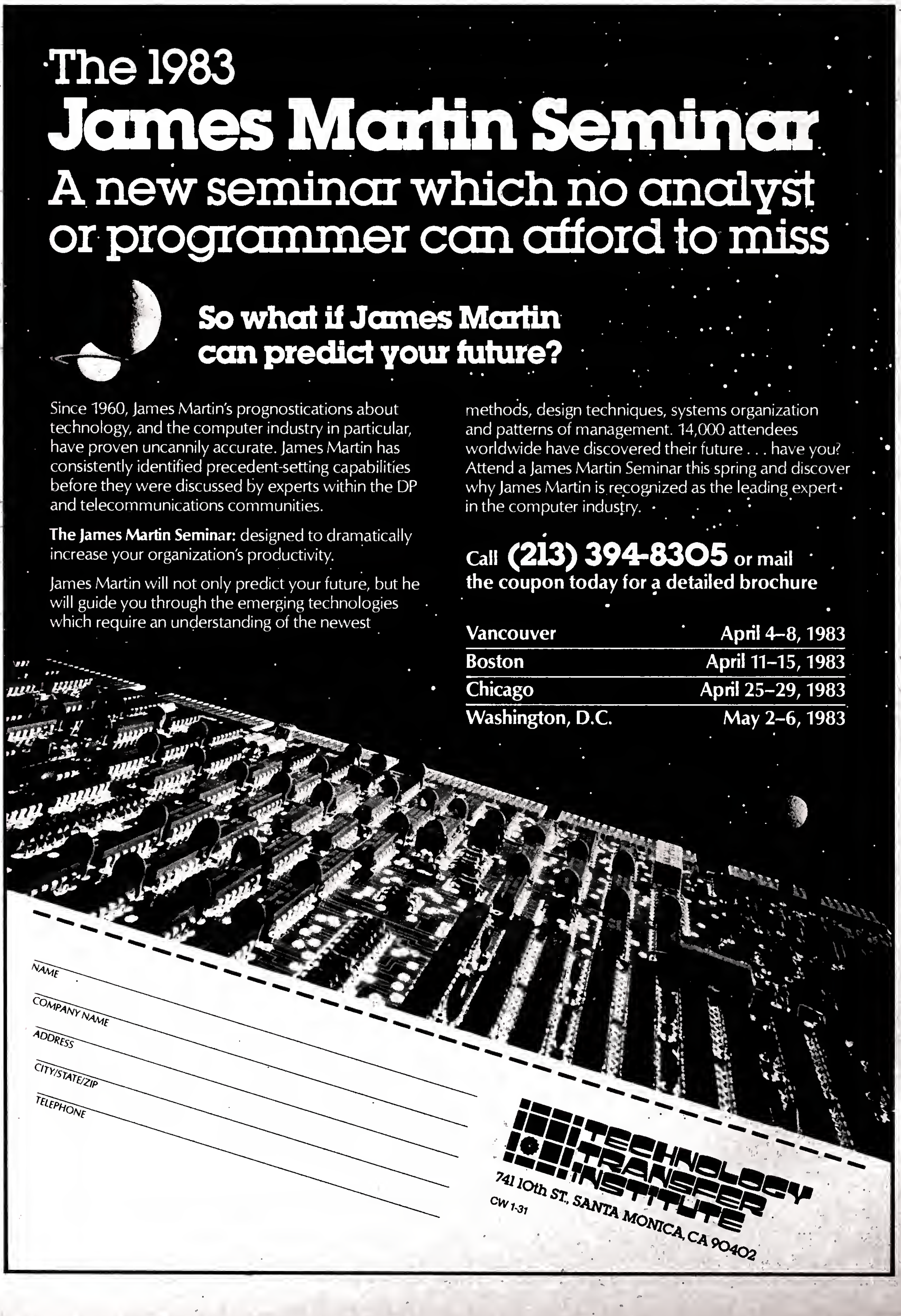
Commenting on the results, John R. Opel, company president and chief executive officer, said, "The 1982 results show significant growth for both net orders and net installations. Shipments of the 3080 processors and the 3380 [disk drive] are strong."

NCR Earnings Show Upturn

DAYTON, Ohio — NCR Corp. reported a 1982 earnings increase of 13% from the previous year to $234 million or $8.75 per share, versus $208 million or $7.72 per share the previous year. Annual earnings figures included a $90 million or $3.35 profit level recorded in the fourth quarter alone.

Revenues in 1982 rose 3% to $3.52 billion from $3.42 billion in 1981.

William S. Anderson, NCR chairman, said, "The company's gains in income on modest increases in revenue reflect the results of our continuing programs to control costs and expenses."



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To Become Apple's No. 2 Man

Lisa's Adopted Uncle Tells Why He Left NAS

E. Floyd Kvamme, 45, joined National Advanced Systems in 1967. He quickly moved from product marketing manager to vice-president of marketing and then to Semiconductor Division general manager before taking over the helm at NAS when it acquired troubled Itel Corp.'s computer customer base in 1979.

Kvamme succeeded in establishing NAS as a forceful competitor in the growing IBM plug-compatible mainframe market. However, toward the end of his career at the company, NAS faced increasingly stiff competition from IBM.

The day after the announcement of Apple's Lisa, Kvamme discussed his days at NAS and his new career at Apple with Computerworld *West Coast Correspondent Robert Batt.*

You have just resigned the top position at a fairly successful mainframe manufacturer to take up what is essentially a No. 2 job at Apple Computer. What was your motivation?

When I resigned from NAS, I had been with the National Semiconductor Corp. for 16 years and had been very involved in the semiconductor industry. When I agreed to take on the job at NAS, the one thing that it did not have was the variety of work that I had enjoyed so much in my days at the Semiconductor Division . . . When I felt the people we had there could carry the ball, I decided it was time to leave because I wanted to gain some of that variety of work again.

When Apple asked me to consider this job, I initially was not aware of the variety of work there is in the personal computer business. But as I came to see the possibilities in the scientific, education, home and — most important — office markets, I decided it would be an exciting thing to be involved with at this time.

Apple is also interested in expanding its international market. I have a lot of experience in overseas markets, I like international business and so all in all it seemed a natural thing to do.

As for taking up a No. 2 post, I don't really like to see myself as the top man, even when I was at NAS. In the business world, it is teams that win and in joining Apple I was invited onto a team. So I don't look on it as a demotion in any way; it's simply a different team.

Apple's Lisa microcomputer is aimed at a user different from Apple's traditional market. Will the marketing strategy for this product be different?

Companies don't determine distribution channels, customers do. The customers for Lisa will primarily be office personnel and so it is a different product for Apple.

Most often large companies have some sort of task force responsible for marketing strategy. In the case of Lisa, our job is to enhance the productivity of the so-called 'knowledge worker.' These customers are not going to go to the local store to buy their personal computer. Therefore, in bringing this product to the market the most important thing for us to consider is how does the potential customer want to be serviced? Obviously they want someone to come around and sell the computer to them.

What do you see as the essential issues in managing the growth of personal computers in large corporations, as they affect the role of the MIS manager?

The total issue relates to data management, programmer productivity and management control. The major concern for the MIS manager is what will happen if these personal computers, which could have a profound impact on certain aspects of a company's operations, are not properly documented.

One of the things that attracted me to Apple was that it has, in Lisa, a product which the MIS manager can feel safe in placing on the user's desk. What troubles MIS managers is that if personal computers require each user to write his own software, their efficiency as a management tool is severely restricted.

There are some people who argue that the pace of technological change in the computer industry today is such that marketing prowess takes precedence over the need to always be on the leading edge of technology. Do you subscribe to this view?

(Continued on Page 70)

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Micros Opening Doors for Nets: Geisco Head

By Lois Paul
CW Staff

ROCKVILLE, Md. — The advent of microcomputers is going to take away some of the stand-alone applications that previously were handled through time-sharing, but will also present opportunities for network transaction-oriented applications that previously would not have been computerized.

This is the view of Gregory J. Liemandt, president and chairman of the board of General Electric Information Services Co. (Geisco). It is also the reason Geisco announced in September 1982 that it was making IBM Personal Computers available to its customers through an agreement with the hardware vendor. The users can access the Geisco time-sharing network and its resident applications, as well as use the microcomputers for local processing.

"I think it is a market expander, if anything," Liemandt said of the IBM Personal Computer. "The [Personal Computer] is another way to distribute power." A time-sharing vendor can try to fight the encroachment of microcomputers and attempt to suggest that all processing should be done on mainframes, but this is a short-sighted, he said.

His feeling is that the computer services industry can bring "a lot of capability to the things that people are having the most trouble with now. When they want to use [Personal Computers] for electronic mail, to tie in their worldwide multinational company from a communication point of view, that is where we want to help them. When they want to have 100 [Personal Computers] in all of their offices all over the country entering orders and communicating with their warehouses to mortgage goods, that is where we want to help them."

Liemandt admitted that the growth in classical time-sharing is truly slowing, and the implementation of the IBM Personal Computers tied into the Geisco network is part of a move on the firm's part to become more of a computer services company than merely a time-sharing facility. He suggested that a shakeout in the time-sharing industries is inevitable.

Gregory J. Liemandt

Kvamme On Tech

(Continued from Page 69)

To be successful in business you need an all-around team effort. You need skill in manufacturing, engineering, finance and marketing. Now there is no question that the company that introduces a new approach to a particular area and invents the business, so to speak, does not need to be right at the forefront of the technology.

IBM's concept of series line computers, for example, as embodied in the 360, was a new concept rather than a new technolgy. Every mainframe manufacturer has followed IBM's example ever since.

However, to the degree you are not at the technological edge, you make yourself vulnerable to competition. You have to be at the technological edge to be a major player in the market. You cannot depend on your reputation of having invented something once because that will wear off. So I disagree totally with the view that marketing is more important than technology.

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Inman Appointed President of Fledgling MCC

By Bill Laberis
CW Staff

WASHINGTON, D.C. — The steering committee of the fledgling Microelectronics and Computer Technology Corp. (MCC) has appointed as president and chief executive officer a man who served as both the deputy director of the Central Intelligence Agency and director of the National Security Agency (NSA).

With his appointment, Bobby R. Inman, 51, becomes the first bona fide employee of MCC, the joint computer technology research venture. Inman's appointment comes on the heels of the U.S. Justice Department's pronouncement that it would not challenge the formation of MCC on antitrust grounds [CW, Jan. 17].

The appointment also suggests that the companies forming MCC will follow a distinctly nationalistic bent in charting the course of the joint venture. Designed to "try to maintain U.S. preeminence and predominance in the microelectronics and computer field," MCC was the brainchild of William Norris, chairman of Control Data Corp.

No 'Corporate Experience'

A retired U.S. Navy admiral, Inman has no previous corporate experience. He served 31 years with the Navy, holding several posts, mainly in intelligence areas, according to a CDC spokesman. He resigned his CIA post last summer. Inman could not be reached at press time for comment.

"It became important for the steering committee to select a chief executive that had technological management expertise and a view of technical and national priorities," the CDC spokesman said, noting that Inman managed several DP development programs while at the NSA. "Because of his [Inman's] experience in dealing with questions about the utilization and protection of U.S. technology, he was the right man for the job . . . He understands the role electronics plays in the national and international scene."

Commenting on possible conflict of interest between Inman's work at MCC and his former government experience, the spokesman said there is no government involvement in MCC at present. However, he added, "there is a possibility of joint activity between MCC and the government at some unspecified time. For many national reasons, the government is obviously interested in what MCC will be doing."

Over the next three to six months, Inman will select a headquarters location for MCC and then recruit managers to head each of the joint venture's main programs: advanced computer architecture, software productivity, computer-aided design and manufacturing and component packaging.

The 10 companies now listed as founding shareholders are Advanced Micro Devices, Inc.; CDC; Digital Equipment Corp.; Harris Corp.; Honeywell, Inc.; Motorola, Inc.; NCR Corp.; National Semiconductor Corp.; RCA Corp.; and Sperry Univac.

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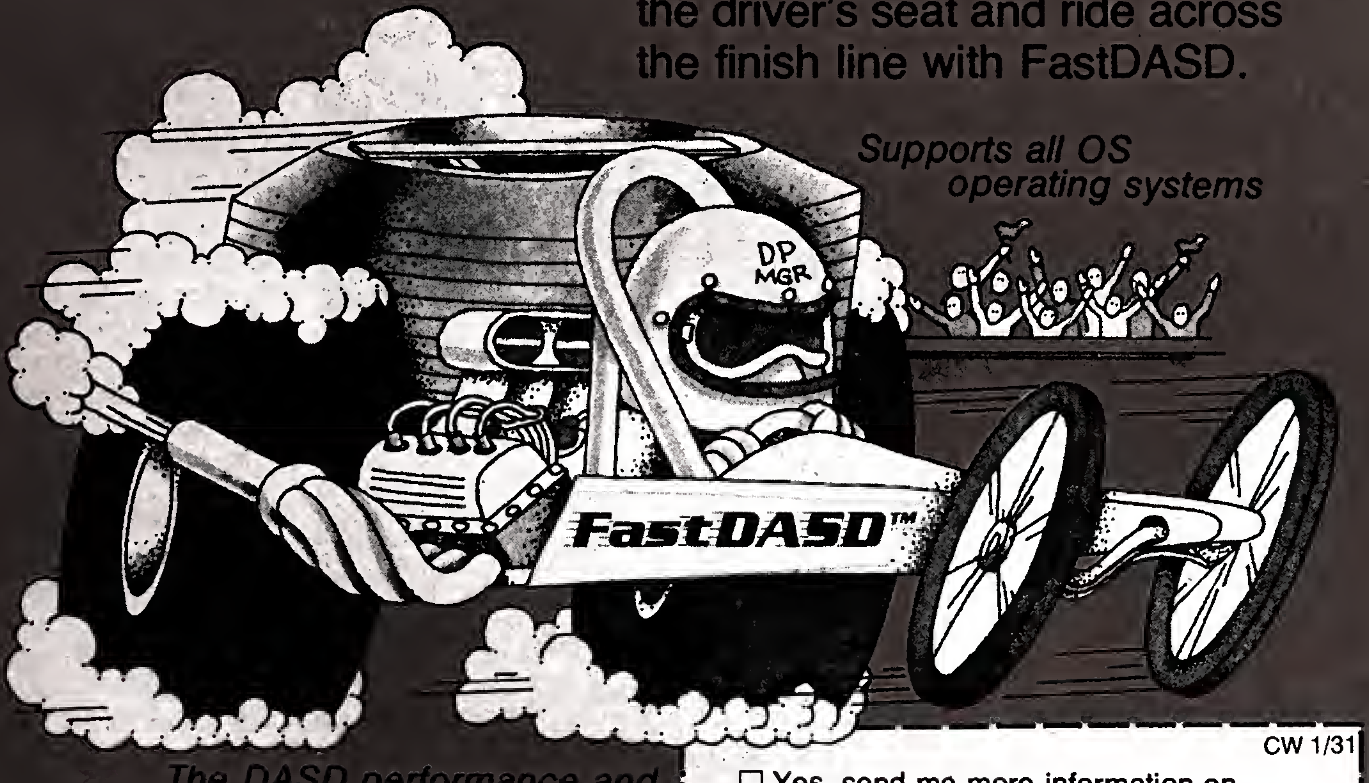

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DEC Reports Earnings Drop

MAYNARD, Mass. — Digital Equipment Corp.'s earnings plummeted 38% to $61 million or $1.08 per share in its second reporting quarter, while revenues rose 5% to $1.02 billion. It was the second consecutive quarterly earnings drop for the minicomputer maker and was predicted both by analysts and Kenneth Olsen, company president [CW, Nov. 15].

For the six months ending Jan. 1, DEC reported profits of $117 million, off 37% from the same period in fiscal 1982.

Revenues for the half year were up 7.6% to $1.94 billion.

The company attributed its earnings dip to depressed capital equipment markets at home and abroad and to major new investments in products, advertising and research and development. DEC officials also said they believe business will improve in the next six months, but that the earnings slide may continue, although less severely than that just reported.

Western Electric Gets AT&T Contract

BEDMINSTER, N.J. — AT&T has selected its subsidiary, Western Electric Co., from a field of six bidders as the supplier of approximately 900 miles of high-capacity fiber-optic systems for five new lightwave communications routes scheduled for service in late 1985.

Western Electric, AT&T said, offered the lowest cost, most technologically advanced system for the project, estimated to cost more than $100 million.

The lightwave systems to be supplied will initially transmit data at 432 bit/sec on a single, hair-thin fiber, with proposed system improvements expected to eventually double that capacity, AT&T announced.

Also submitting bids for the project were Fujitsu America, Inc.; Nippon Electric Co. of America, Inc.; North American Philips Corp.; Citcom Systems, Inc.; and ITT Telecommunications Corp.

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U.S. Spends Too Much Abroad

IRS Regulation Seen Detrimental

WASHINGTON, D.C. — An Internal Revenue Service regulation on industrial research and development expenditures is forcing American firms to spend a disproportionate amount of their R&D funds abroad, where tax laws are less onerous, according to a new study.

The report, scheduled for release Feb. 1, will be used to help lobby the government for a repeal of the IRS regulation, according to the Electronic Industries Association (EIA), one of four trade associations sponsoring the Arthur Andersen & Co. study. The EIA noted that the controversial regulation has been held in abeyance since 1981 while its impact is being studied by the Treasury Department.

The study is based on a survey of 85 corporations, which accounted for more than $12 billion in corporate R&D in 1981, which was more than one third of the total $34 billion spent that year by all private industry. The survey found the IRS regulation contributed significantly to a drain of U.S. R&D funds from this country, EIA said.

The combination of the regulation's complex formula for allocating R&D expenditures among the countries where U.S. multinationals do business and foreign tax incentives is creating "an alarming shift" of U.S. funds overseas, according to the association.

IBM Forms Leasing Firm

(Continued from Page 67)

The new venture is starting business with 30 employees and is capitalized at $13 million. The president of the new firm is a former IBM Japan executive, M. Motoayashi, according to IBM.

IBM said Japan Computer Leasing Co.'s involvement is its first attempt to become directly involved in an outside leasing company. Some analysts predict IBM will also announce similar joint leasing arrangements in Europe.

In its "EDP Japan Report," International Data Corp. Japan (IDC Japan) said IBM became involved in Japan Computer Leasing Co. in an attempt to regain its position as the number one computer vendor in Japan. IBM lost that position to Fujitsu, Ltd. two years ago, according to IDC Japan.

Japan Computer Leasing Co. appears to be a counterpart to the Japan Electric Computer Co. (Jecc), a computer leasing company which was jointly established by six Japanese computer manufacturers. IDC Japan said the joint IBM venture "will undoubtedly have a great impact on the Jecc rental system," noting that about five years ago the firm was able to offer lease prices far lower than third-party leasing firms.

IDC Japan also points out that Orient Leasing has a reputation for being one of the most aggressive leasing companies in Japan. "The aggressive pricing actions taken by Orient Leasing caused much consideration by IBM Japan which had to decide whether to match Orient Leasing or bring it over to [IBM's] side."

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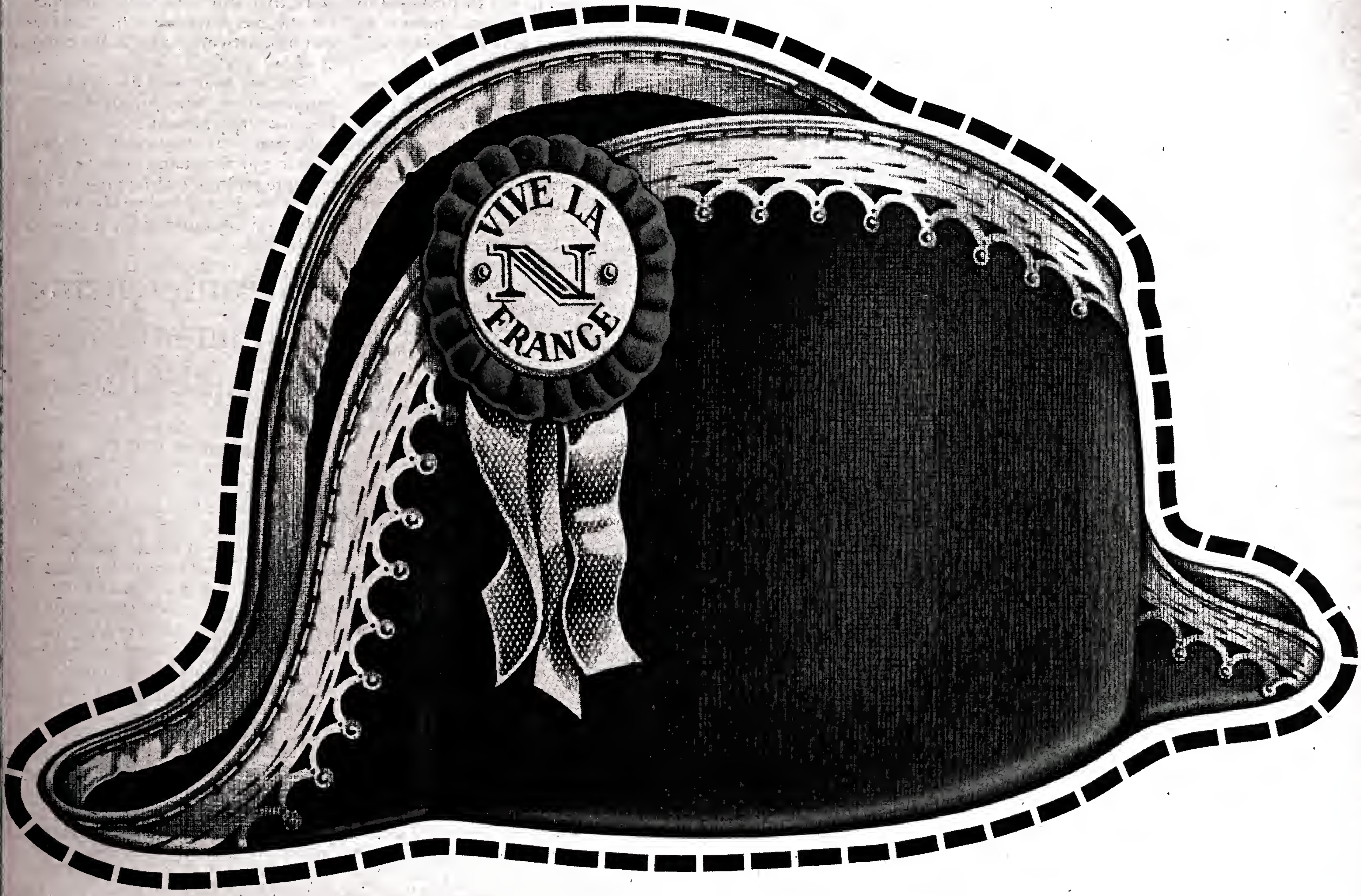

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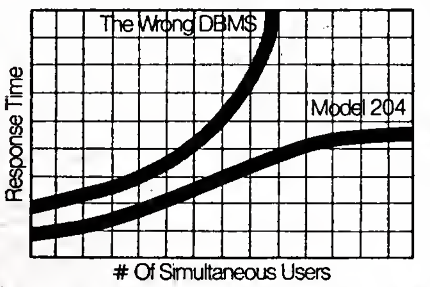

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Ungermann-Bass Agrees To Acquire Amdax Corp.

By Bruce Hoard
CW Staff

SANTA CLARA, Calif. — Baseband and broadband local-area network manufacturer Ungermann-Bass, Inc. has agreed in principle to acquire Amdax Corp., maker of broadband local networks and CATV products.

Both of the privately held firms refused to divulge details of the deal, saying only that it involves a stock transfer and there are no foreseeable impediments to its consummation. It is subject to approval by stockholders from each company.

Ralph Ungermann, president of Ungermann-Bass, which is located here, said the deal "was a very good strategic move for both companies." He cited Amdax's experience in broadband modem technology and said broadband transmission is important to his company's plans.

Ungermann touted Amdax's work in developing a high-performance host-to-host interconnect capability based on a 50M bit/sec token passing ring structure.

He said his company will utilize that technology to challenge Network Systems Corp., the preeminent mainframe-to-mainframe local-area network manufacturer, the president declared.

That work has been done at the Amdax research and development center in Boca Raton, Fla. The company has another R&D facility on Long Island, in New York.

Cablenet Discontinued

Cablenet, the general-purpose broadband local network produced by Amdax, has been discontinued. Asked if Cablenet users can expect continuing support for their systems, Ungermann replied, "We will offer Net/One as a replacement for those companies who use Cablenet."

Net/One is the name used for both Ungermann-Bass' broadband and baseband local-area networks.

Because both networks use the same coaxial cable, the transition from one to the other will be minimal, he said, adding, "there were no large Cablenet installations."

The president said Ungermann-Bass will not employ its newfound CATV capabilities to compete with Sytek Corp. for supremacy in broadband metropolitan area distribution, a goal Sytek is pursuing through its "Metronet" project.

"That market is off in the future still and one we are not strategically pursuing," he observed. Sytek is another CATV-based broadband local network manufacturer.

Like Ungermann-Bass, it combined forces with a manufacturer of CATV equipment, General Instrument Corp.

Ungermann said there will be no layoffs in conjunction with the acquisition, instead predicting "short-term hiring."

Amdax President Ivan Socher echoed Ungermann's explanation for the deal. "It was a good marriage between different technologies," he stated. "We have things that they didn't have and they have things that we didn't have in a technical sense."

Socher said "migration plans" have been worked out for each individual Cablenet user. "It's a swap-out of equipment," he said. The equipment that will have to be swapped are the bus interface units, devices that link network nodes to the coaxial cable.

Cablenet users will be given Ungermann-Bass bus interface units free of charge, he said.

Socher will stay with Amdax, working to reorganize the company by integrating overlapping R&D functions and bolstering the Amdax facility on Long Island for increased production.

Teleconferencing Equipment Sales To Swell: Studies

NEW YORK — Sales of teleconferencing equipment will top either $580 million by 1986 or $430 million by 1987, depending on which of two recently released studies are to be believed.

The number of business meetings held via various forms of teleconferencing will increase from 89,400 in 1981 to 1.8 million in 1986, according to Quantum Science Corp.'s report entitled *Teleconferencing Product Introductions Proliferate — Interactive Audio/Graphics Workstations Have Arrived.*

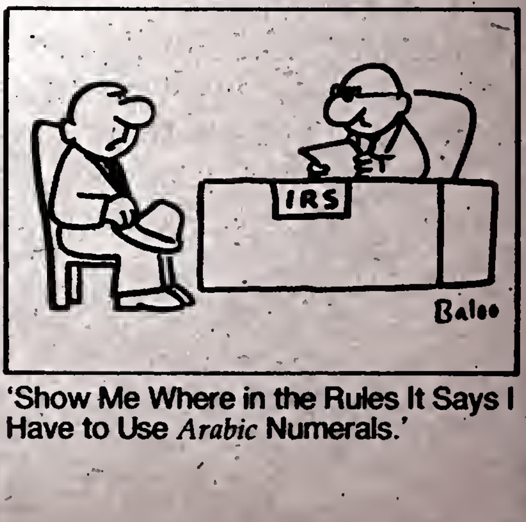
A total of 1,380 teleconferencing rooms will be shipped in 1986, leading to equipment revenues of $123 million, according to the study.

Sixty-six percent of those revenues, or $81.4 million, will be attributed to motion video teleconferencing rooms, the report continued.

The report is available as part of a client subscription service, which costs $10,000 from the vendor, located at 1114 Ave. of the Americas, New York, N.Y. 10036.

Videoconferencing, produced by Creative Strategies, predicts that intensifying across-the-board demand for equipment and service revenues, sparked by a greater awareness of videoconferencing time and cost savings, will dramatically expand the aggregate market at a compound annual growth rate of 59% during the next five years, with equipment and service sales topping $430 million by 1987.

Videoconferencing includes a videoconferencing implementation guide and costs $1,450 from Creative Strategies, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.



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Calls for End to 'Scapegoating of Japan'

Brown Pushes High-Tech Policies in Senate

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Former California Gov. Jerry Brown, visiting the city he had hoped to call home for the next six years, recently appeared before the Senate Subcommittee on Savings, Pensions and Investment Policy to urge national adoption of some of California's innovative high-technology policy measures.

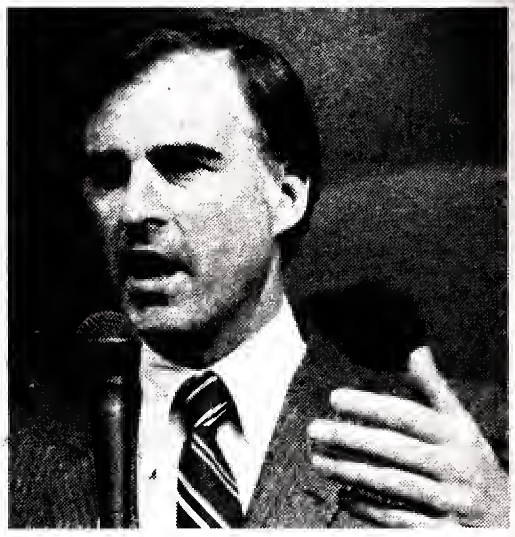
Brown, defeated in November in his bid for a U.S. Senate seat, called for an end to the "scapegoating of Japan" and for development of an American "bipartisan domestic economic policy" that, combined with government, business, academic and labor support, would promote development of high-technology industries and enhance U.S. competitiveness internationally.

Sen. John H. Chafee (R-R.I.), subcommittee chairman of the panel that is seeking ways to support rapid growth in high-technology industries [CW, Jan. 24], welcomed Brown's suggestions, saying, "I couldn't agree with you more. You and I are singing in the same choir."

Brown cautioned against thinking the competitive problems of U.S. business can be solved with "one statute, one technological fix," and said what is needed is "a new vision, a new consensus and a new discipline." He presented the subcommittee with documents and reports from California initiatives, including that state's commission on industrial innovation, which suggests means for promoting high-tech industries.

His formula for this effort, he said, consists of methods for making more capital available to new and established industries through government tax incentives and amended banking and pension fund investment laws that would increase the number of investment sources. Added to this, he said, is the need for improved educational systems via better pay for teachers and greater access to computers and research and training and retraining programs.

On Japan, Brown warned against protectionist measures the U.S. might adopt to fight Japanese imports, saying, "I believe Japan is being made a scapegoat for doing what we ought to be doing ourselves . . . It isn't fair for working people to be the sacrificial victims of this whole economic process," he added, explaining unemployment is largely the result of U.S. failure to develop a new industrial strategy to counter the economic slump in numerous moribund American industries.



Former California Gov. Jerry Brown seeks enhanced position for U.S.

After Taxes, Intel Cites 10% Gain

SANTA CLARA, Calif. — Intel Corp.'s pretax earnings slid 24.6% in fiscal 1982, but a lower tax rate has yielded a nearly 10% earnings gain for the year, the company reported.

Earnings totaled $30 million or 65 cents per share, up from $27 million the previous year. Revenues increased to $900 million from $788 million, a 15% annual gain. Meanwhile, fourth-quarter earnings were $8 million, up from the $4.6 million reported in the final quarter a year ago. The current figure reflects a $5.5 million tax benefit.

Gordon Moore, company chairman, said, "Our business continues to be affected by the depressed world economy and strong international competition, particularly in memory components. During the first half of the year, we experienced strong growth, and it appeared the recovery was at hand. This [was] a mirage."

DEC Announces Gift Of $1.6 Million to BU

BOSTON — Digital Equipment Corp. will donate $1.6 million in computer equipment to a $49 million science and engineering center to be built by Boston University. Included in DEC's donation will be two VAX 11-780 superminicomputers and a System 20/60.

The center project "will allow the university to consolidate its position as a major resource for New England's high-technology industries," the university said.

DEC's donation will support research in the university's College of Engineering and its newly formed Department of Computer Science.

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Exec: Future Legislation May Harm Industry

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — The newly convened Congress may be tempted to enact legislation that could prove harmful to the domestic computer industry.

This was the fear expressed here by Robert Kirkwood, recently appointed director of government affairs for Hewlett-Packard Co. Looking ahead to possible legislation in 1983, Kirkwood said the relative freedom from government regulation that the computer industry has enjoyed may be in jeopardy.

Robert C. Kirkwood

"As the computer industry continues to expand, it is attracting a growing body of interest from policy-makers," Kirkwood said. "Legislators are becoming concerned about regulating information as the computer industry converges towards the highly regulated communications industry. We need to understand the issues at stake, avoid the regulation of the computer industry itself and instead regulate the phenomena that govern it," he said.

Pointing to potential regulatory dangers, Kirkwood noted that government efforts to clamp down on the theft of high-technology secrets to the Soviets and Japan could get the U.S. "into a very sticky political problem. An essential ingredient for solving it will be for the computer industry to rid itself of the attitude that says 'everybody does it' [steals secrets].

"The issue of security is much broader than simple technology transfer," he continued. "It really goes to the heart of our business ethics. If we do not re-establish that ethic, the instinct of government to protect us against ourselves will be too great, although what it would do will probably be ineffective and could actually damage the industry."

For this reason, Kirkwood also pinpointed the renewal of the Export Administration Act in 1983 as crucial to the development of the computer industry. Currently a number of companies are jointly lobbying the administration and congressional officials to make ammendments to the current legislation, which expires Sept. 30.

"We acknowledge the security concerns that need to be addressed. At the same time, commercial interests should not be undermined by the legislation. In particular, we feel that the export of technology into the West should not be blocked," he said.

Kirkwood likened the current arrangements, which severely restrict the export of computer technology to the Soviet Bloc, to the use of a club to perform a delicate operation when a scalpel would do. "There is a lot of frustration in the industry with the current regulations."

Over '81 Figures

Honeywell Earnings Up 5%

MINNEAPOLIS — Honeywell, Inc. announced a 1982 net income of $272 million, or $12.16 per share, up 5% over the previous year's earnings mark of $259 million, or $11.38 per share.

The earnings figure included $66 million in capital gains recorded earlier in the year, a spokesman for the company said.

Earnings in the fourth quarter were pegged at $88 million, down 13% from the last quarter in 1981.

Edson Spencer, company chairman, said, "The falloff in computer orders, necessitating a reduction in the size of our operations, was only partially caused by the recession, which adversely affected industries that are our major computer customers.

"In addition, the information systems market has become much more competitive and is changing rapidly as specific user applications become more apparent," he added.

"With lower backlogs and an uncertain economy, our Informatin Systems business will face another difficult year in 1983, with operating profit in the first half particularly under pressure."

The Information Systems operating profit plummeted in 1982 to $80 million, down 49% from the $158 million earned in 1981.

Memorex to Sell Intel Products

SANTA CLARA, Calif. — Intel Corp. and Memorex, a subsidiary of Burroughs Corp., have announced an agreement whereby Memorex will market Intel's solid state information storage products directly to users of IBM and IBM-compatible mainframes.

The products are high-speed, high-capacity, solid-state subsystems and will initially include the Memorex 3864, called the Fast 3825 by Intel. The terms of the agreement call for the companies to pursue joint development of new storage products.

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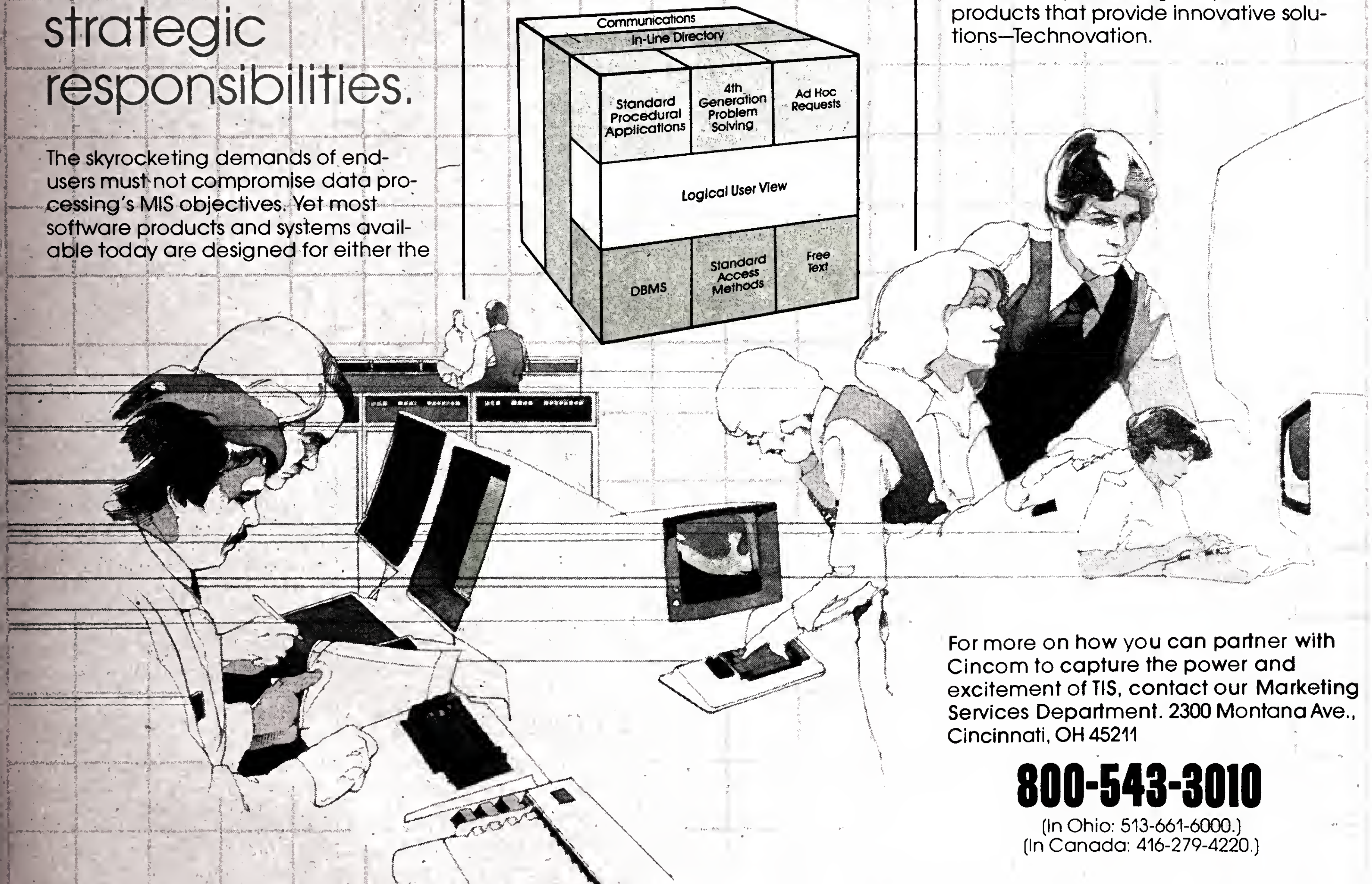

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Pennsylvania State University's Computer Science Department has begun two new industrial contract programs designed to allow member industries to recruit computer science graduates and to keep Penn State faculty members aware of industrial manpower needs and research interests.

*

Christian Rovsing of Denmark, a supplier of computer networks and stand-alone systems has established an independent U.S. subsidiary, CR **Computer Systems,** Orange, Calif., to provide complete marketing and software support for the firm's product line. Sales offices in the San Francisco area and Houston are planned.

*

Epson America, Inc. is donating several computer systems to the National Park Service for collection and retrieval of ecosystem data at the new Santa Monica Mountains National Recreation Area.

*

Transcanada Telephone System and **American Satellite Co.** (ASC) have agreed to offer transborder satellite services to Canadian and American business customers. Private-line service including voice, data, video teleconferencing and image transfer services will be provided on both Telesat Canada's Anik satellites and the satellites used by ASC.

*

Nashua Corp. has instituted several cost-cutting measures including a worldwide 8% reduction in employees, a reduction in salaries of top management by 12% to 20% and a deferral of pay increases for both union and nonunion personnel in anticipation of losses of $30 million to $35 million for the year ending Dec. 31. The firm also expects its board of directors to approve a suspension of quarterly dividend payments at its next meeting.

*

Installation and maintenance for multivendor DEC-compatible peripherals and controllers is available from **CCG Computer Services Corp.,** Costa Mesa, Calif., a newly formed subsidiary of California Computer Group, Inc.

*

Zenith Radio Corp. will produce teletext receiving equipment for Taft Broadcasting Co.'s Cincinnati teletext service under terms of what is reported to be the first such agreement between a television set manufacturer and a TV broadcaster. The five-year agreement will take effect when the Federal Communications Commission authorizes commercial broadcast teletext service in the U.S.

*

Systems & Programming Resources, Inc. has formed the Strategic Resources Center in Oak Brook, Ill., through the consolidation of two Chicago sales offices and its computer services center. The new center will provide services ranging from consultation through implementation of new systems as well as upgrading of existing systems.

*

Western Union has signed an agreement with Siemens Communications Systems, Inc. to provide nationwide third-party maintenance for Siemens' 4100 series of electronic message systems.

*

Tymshare, Inc. has signed a letter of intent to acquire 80% of FTC Communications, Inc. of New York, an international record carrier, from FTC Industries, Inc. FTC Industries will retain the remaining 20%.

*

Stratus Computer, Inc. and **Technology Consulting Corp. (TCC)** will jointly market Technology Consulting's point-of-sale terminal support system, Postss. TCC will provide installation, training and support while Stratus will provide hardware and system software installation, support and maintenance.

*

Microbase Corp. has formed Microbase Information Service, which will provide individualized reports to customers on products developed for the major brands of microcomputers. The reporting service begins March 28 and additional information can be obtained from P.O. Box 7459, Greenwich, Conn. 06836.

*

Software Library, a rental outlet for personal computer software, has opened in Montclair, N.J. Business, educational and home entertainment packages are available and users may apply rental fees to the purchase price.

*

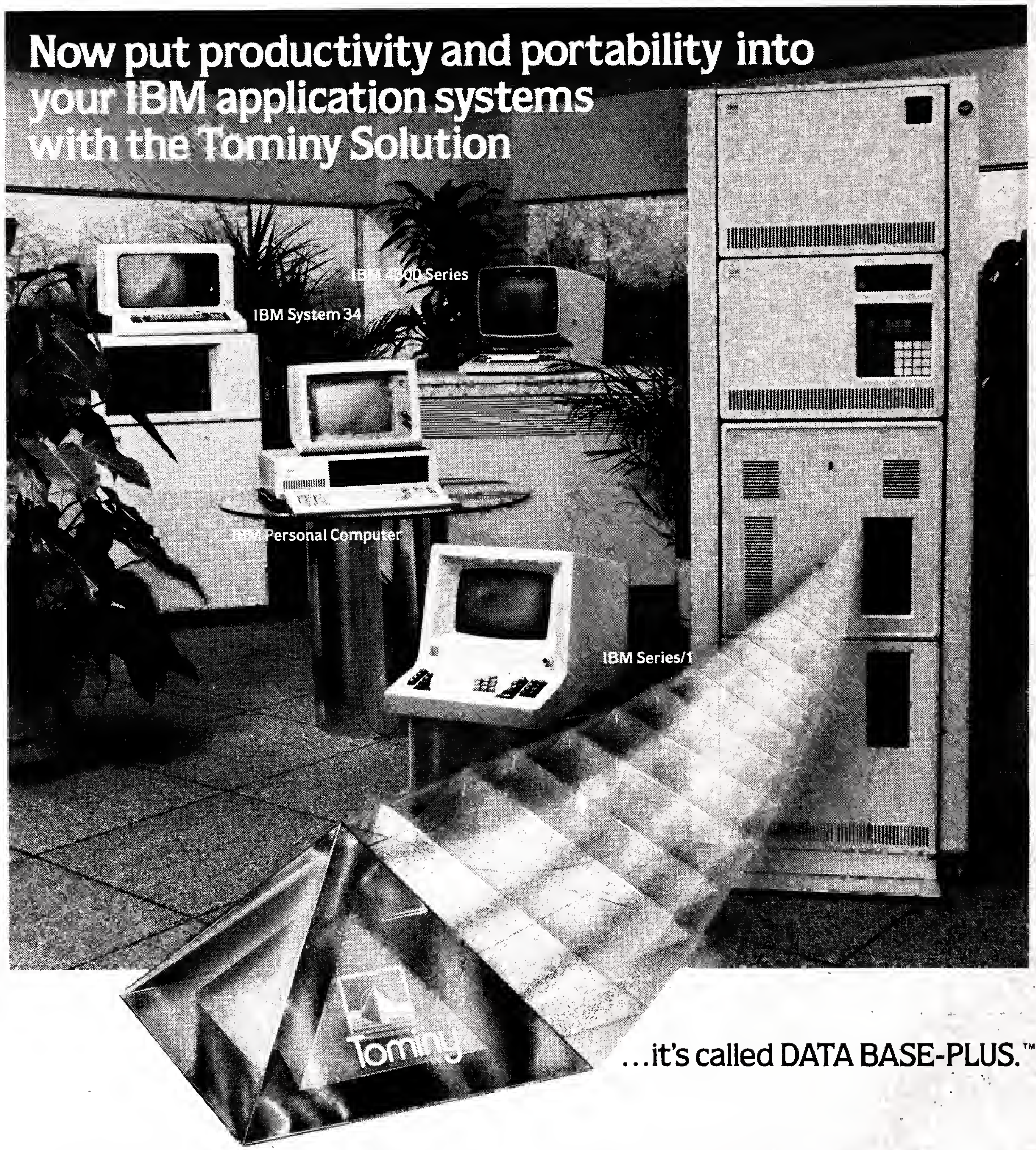
Terminals Unlimited, Inc. (TU), Falls Church, Va., has acquired **Savin Corp.'s** ongoing service, parts, supplies and repair business for the Savin Wordmaster 900 and Veritext 950 series. The $1 million purchase included 16 service sites and a central repair depot in Sunnyvale, Calif. TU has also acquired all of **Memorex Corp.'s** 2051 installed lease-based terminals.

*

TRW, Inc.'s Customer Service Division, Fairfield, N.J., will provide full maintenance service on Hazeltine Corp.'s computer terminal products under a new, expanded agreement recently signed by the two firms.

*

Digital Research, Inc. has formed a Commercial Systems Division combining the firm's three Strategic Business Centers (SBC) — Language, Operating Systems and Graphics. Gordon Eubanks Jr., vice-president of the Language SBC, has been named vice-president and general manager of the new division.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Information Systems Department
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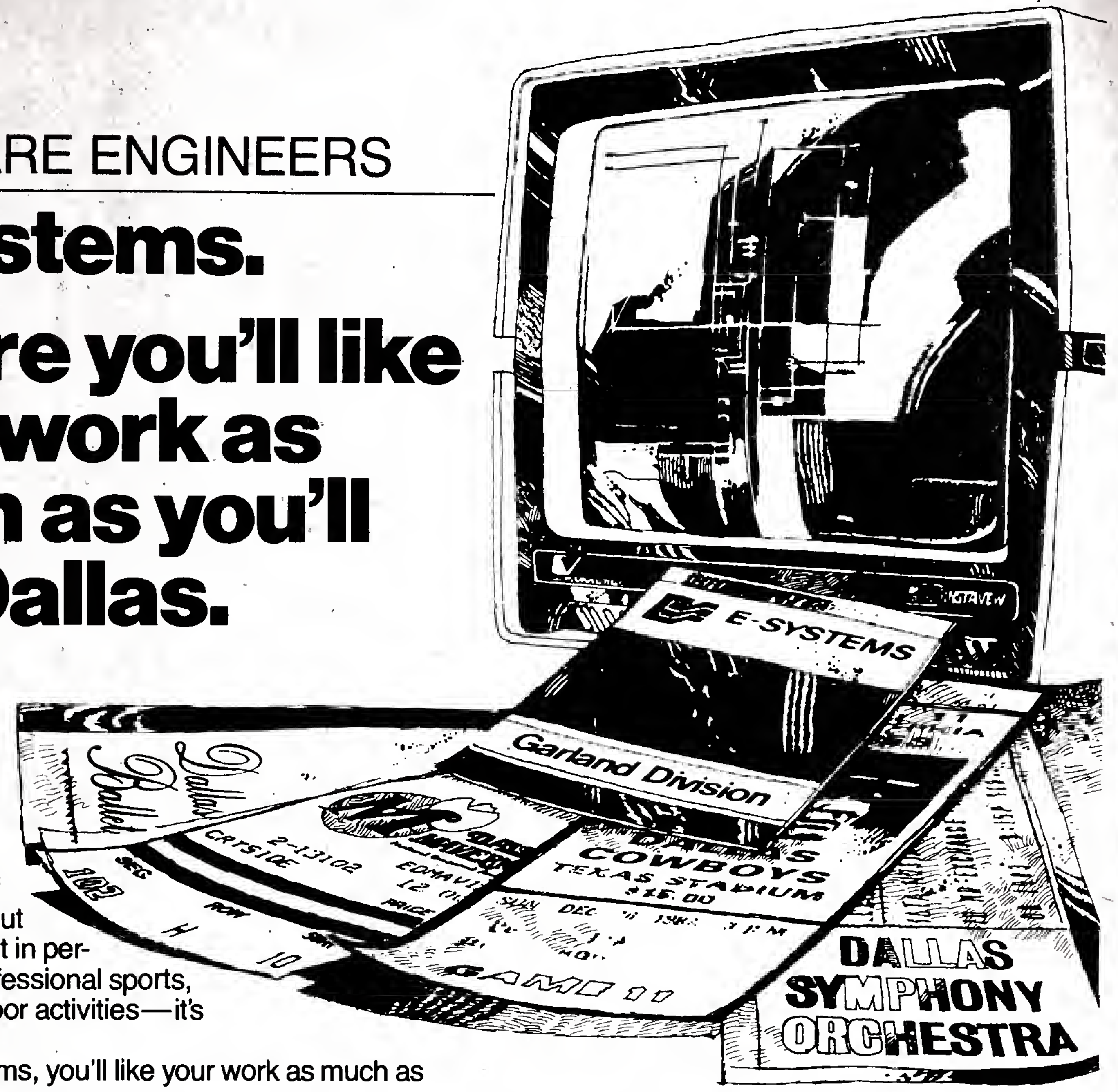

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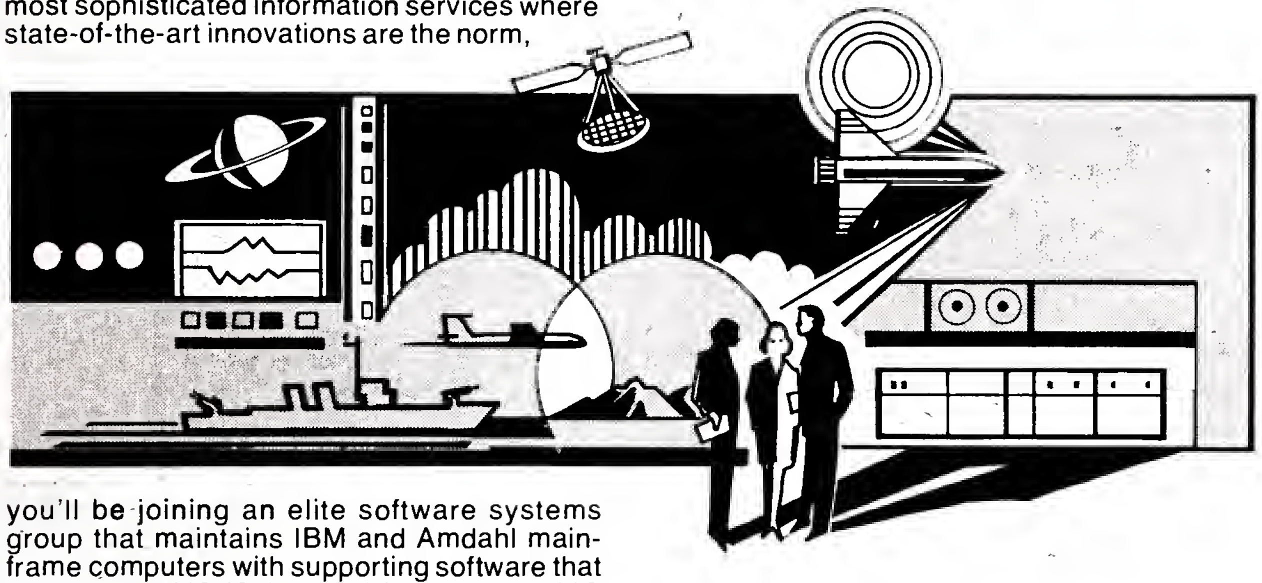
48 Constitution Drive
Bedford, NH 03102
(603) 472-8844

Fees and relocation expenses company paid.

Computer Software Engineers/ Systems Programmers

Many things fly, maneuver and run on software at Kearfott.

Including careers.



Whatever your software specialty, you have a choice of career paths at Kearfott—in operating systems...commercial applications...and computer software engineering. Right now we're engaged in many of the most difficult, stimulating, and ultimately rewarding technological undertakings imaginable. And all of our dozens of on-going projects depend on strategic software advances in communications, logistics, MIS and guidance systems.

At our Data Center, one of the country's most sophisticated information services where state-of-the-art innovations are the norm, you'll be joining an elite software systems group that maintains IBM and Amdahl mainframe computers with supporting software that includes MVS/SE-2, SE/A, JES 2, IMS DB/DC, CICS, TSO, WYLBUR, ACF/VTAM, ACF/NCP, SAS, information systems. This Center is tied in to all our plants via an on-line computer and provides an instant interchange of technical data. Here you'll have the opportunity to develop user-friendly software and become involved with educating company users and consulting on, and resolving, daily problems.

in MIS—the expanding sphere that has helped give Kearfott's rarefied environment a very solid basis—you'll run the gamut. Accounting. Finance. Payroll. Inventory and manufacturing controls. All involve COBOL programming, CICS, MVS, IMS, and data base design and Telecommunications.

Software engineering offers yet another challenge. Have strengths in realtime software development? Simulation or validation techniques? Firmware and microprocessors? Kalman filtering? Fortran, JOVIAL or Ada compilers? Let us tell you about our variety of minicomputer projects and resources.

The path of the future for software professionals can begin with Kearfott if you have the minimum of 3 years experience that we require in a large-scale IBM system, with HP, DEC, or airborne minicomputers or microcomputers in realtime military systems.

Find out why software careers fly higher at Kearfott by sending your resume to: Carol Batte, Singer Company, Kearfott Division, 1150 McBride Avenue, Little Falls, NJ 07424.

Kearfott
a division of The SINGER Company

An equal opportunity employer, m/f, who creates opportunities

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TEXAS A&M UNIVERSITY
DIRECTOR OF ADMINISTRATIVE DATA PROCESSING

Texas A&M University invites applications and nominations for the position of Director of Administrative Data Processing. Texas A&M University, located between Dallas and Houston is a state supported land grant institution with approximately 36,000 students.

Description of Position: The Director reports directly to the Vice President for Fiscal Affairs and has responsibility for the operation of a large scale computing center equipped with linked Amdahl 470 V-6II and 470 V-8 computers using MVS/JES3 operating and IMS data base/data communication systems. The Center has a staff of 106 employees and is directly responsible for administrative applications, development and support as well as the operation of a large local network and a statewide network serving other educational institutions and state agencies.

Qualifications: Candidates must have a significant record of achievement in administration and planning including at least five years experience in a large-scale computing operation preferably in higher education. An advanced degree is preferred. In evaluating the candidate particular attention will be given to previous achievements which give evidence of:

- Knowlege of universities as a unique management setting
- Ability to foster cooperation in administrative operations
- Skill in applying automation to improve organization of productivity

Salary: Open and Competitive

Availability: Position will be filled by July 1, 1983.

Nominations or applications including a resume and four references should be sent by March 10, 1983 to:

Mr. Robert Smith,
Assistant Vice President for Fiscal Affairs and Controller
Chair, Search Committee
Texas A&M University
Coke Building
College Station, Texas 77843

An Equal Opportunity Affirmative Action Employer

1983 DP CAREERS

Now is the right time to consider new career opportunities. Many corporations are seeking Professionals with a variety of systems experience. All are Sunbelt based.

- **DIR MIS $65,000+ bonus pkg.** Corporate level position responsible for sys. dev., opns., tech. support, data base admin. and comm.
- **MGR DISTRIBUTION SYS $45,000+ bonus** Develop distribution system for major retail corporation. Mini and supervisory exp. preferred.
- **DATA BASE ADMINISTRATION $42,000** Supervisory exp., min. 5 yrs. IMS DB/DC exp.
- **MANAGER FINANCIAL SYSTEMS $40,000** Develop financial applications for major mfg. firm.
- **PROJECT MANAGER $40,000** Requires extensive user contact plus some travel.
- **PERFORMANCE ANALYST $38,000** Sys. tuning, capacity planning in multi CPU IMS DB/DC env.
- **COMPUTER ANALYST $32,000** Strong tech. skills plus good applications exp.

These are only a few opptys that currently exist. We also have many requirements for programmers, programmer analysts, and tech. analysts with OS/MVS, DOS/VSE, IMS DB/DC and CICS experience.

ALL FEES PAID BY CLIENT COMPANIES
Contact: Larry Stone or Jimmy Buck
704/375-0600

FOX-MORRIS
Personnel Consultants
1350 The Johnston Bldg.
Charlotte, NC 28281

SENIOR SOFTWARE ENGINEERS

This position requires experience with Microprocessor Assembly and high level structure languages applied to real time graphics. Equivalent of 5+ years experience and a BSCS/BSEE preferred. Responsibilities involve software analysis, design, and coding for video game systems.

We are the maker of ColecoVision and the Pac-Man portable table top arcade games, and our extraordinary growth in consumer electronics provides superior career growth potential. Attractive compensation and benefits package.

Send resume with salary requirements in confidence to:
JOYCE MENDOZA, Technical Recruiter

HUMAN RESOURCES DEPARTMENT

COLECO
Industries, Inc.
945 Asylum Avenue, Hartford, CT 06105
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WALT DISNEY WORLD CO.
CAREER OPPORTUNITIES

WALT DISNEY WORLD CO., currently undergoing a tremendous expansion with the recent opening of EPCOT Center, has immediate openings in the following areas:

DATA COMMUNICATIONS MANAGER

Requires a B.S. in Computer Science or Math. An M.B.A. is preferable. Ten years' Data Communications or Telecommunications with five years' management experience required. Good technical Data Communications skills essential.

PROGRAMMER ANALYSTS

Innovative Programmer Analysts with 2 - 5 years' recent system development experience on large scale business computers are needed to take an active role in the design of batch and online business systems using COBOL as primary language.

DATA PROCESSING OPERATIONS MANAGER

Qualified applicants will possess a college degree, preferably in Computer Science with 6 - 8 years' Computer Operations management. Experience with a medium to large UNIVAC 1100 installation is required. "A people-oriented" professional with good verbal and written communication skills is essential.

REALTIME PROGRAMMERS

Strong recent experience in system design and development with emphasis on Microprocessor Control Systems along with being proficient in Assembly Language, Pascal and C on INTEL. Experience on DEC, SPERRY UNIVAC MICROPROCESSOR and Hewlett Packard Mini Computers. A degree in Engineering or related technical discipline is required.

EDP AUDITORS

Our Corporate Management Audit Department has immediate openings in California and Florida for EDP Staff Auditors. Qualified individuals must have a B.S. in Accounting, or Computer Science, and must have a minimum of 2 - 3 years' experience as an EDP Auditor, preferrably in a public accounting setting. Familiarity with UNIVAC 90/80 or 1100 Series machines is desired.

Qualified applicants should send resume and salary history, in confidence to:

WALT DISNEY WORLD CO.
Professional Staffing MIS-2
P.O. Box 40
Lake Buena Vista, FL 32830

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SOFTWARE DEVELOPMENT ENGINEERS

Be part of a small, highly talented group of industry professionals and contribute to a major software project — enhancement of our 32-bit multiprocessor computer system — and be on board for the highly visible challenge of future product development. Choose your specific area of development:

- **OPERATING SYSTEMS** and related programs requiring familiarity with high level and Assembler languages.
- **DATA COMMUNICATIONS** requiring a thorough working knowledge of asynchronous protocols & line drivers. Assembler langage experience required.
- **FILE MANAGEMENT** development of Data Dictionary, Query/Report & Recovery modules requiring experience in ISAM or DBMS. Knowledge of PASCAL desirable.

These positions all require a related BS/MS or equiv. and 2 or more yrs. directly related industry experience.

BTI offers a competitive salary & benefits package, flexible working hours, 34 paid days off each year, an informal working environment and much more. For immediate consideration, please send resume to B. Hailey, BTI COMPUTER SYSTEMS, 870 W. Maude Ave., Sunnyvale, CA 94086. (408) 733-1122. An equal opportunity employer.

BTI COMPUTER SYSTEMS

JANUARY 24, 1983
POSITIONS: TWO INSTRUCTORS IN DATA PROCESSING.

9 Month Position. One beginning March 1, 1983 and one beginning Sept. 1, 1983. Summer Teaching Opportunities Available.

COLLEGE: Nestled in the scenic foothills of the Blue Ridge Mountains midway between Greensboro, NC, and Roanoke, VA, Patrick Henry Community College is a comprehensive two year college serving the City of Martinsville, Henry and Patrick Counties, and portions of Franklin County. The service region is highly industrialized in both furniture and textiles and has a population of approximately 100,000. There are numerous recreational opportunities including nearby Smith Mountain Lake and Fairystone State Park. The College is dedicated to academic excellence in both the College parallel and oocupational/technical curricula. An occupational/technical building has been approved for construction and will house a new, modern data processing lab designed solely for instruction.

DUTIES: Teach courses in two year Diploma in Data Processing and one year Certificate in Computer Operations curricula. Courses include flowcharting; computer programming in RPG, COBOL, ASSEMBLER, and FORTRAN; computer operations; computer programming logic; and systems analysis. Responsibilities will also include office hours, academic advising, and committee activities. Teaching assignments may include day, evening, and off campus classes.

QUALIFICATIONS: Minimum: Bachelor's Degree and two years related occupational experince. Salary is dependent upon qualifications and experience.

Applications must include an official college application form, resume, and college transcripts. Applications and information may be obtained from and returned to:

Personnel Office
PATRICK HENRY COMMUNITY COLLEGE
P.O. Drawer 5311
Martinsville, VA 24115
Tel.: 703-638-8777 x206

Applications must be received or postmarked no later than February 18, 1983 for March 1 position, and April 30, 1983 for September 1, position.

An Affirmative Action/EOE

ILLINOIS STATE UNIVERSITY
Information Systems/ Computer Applications

Tenure track faculty positions for Aug. 83 in an **information systems/computer applications** program. Areas: All considered. Special interest in structured analysis and design, online systems/data comm, software engineering. Oual: PhD and computer experience or MS and industry experience. **Commitment** to teaching and application driven research. Ability to relate to application areas (esp. Business, Education, Math) desired. **Closing date: March 15, 1983 or when positions are filled.** Contact: **Dr. M. Powers, Chm, Applied Computer Science Department, Illinois State University, Normal, IL 61761**

Equal Opportunity/
ffirmative Action University.

VERMONT
INFORMATION SYSTEMS ANALYST

A career growth opportunity exists for a Systems Analyst to design and develop financial aid administrative systems. This newly created position offers challenging work in a good environment and requires excellent analytical and communication skills. Relevant work experience on smaller IBM systems such as System 34 or System 38 is desirable. Bachelor's Degree required, Master's preferred. Excellent salary and benefits. Please forward resume with qualifications to:

Information Systems Analyst
Vermont Student Assistance Corp.
P.O. Box 2000, Champlain Mill
Winooski, VT 05404

COMPUTER SCIENTIST

with Industrial Engineering background. Duties include using MTM, methods improvement, economic justification, cost reduction, line balance, man power planning and labor efficiency. Primary focus on automating plant fuctions. Programming languages COBOL, BASIC and ASM. Must possess MS Computer Science with BS Industrial Engineering or equivalent training and at least one year of related job experience. 40 hours/week. $20,000/annual. Equal Opportunity Employer. **Send resume to ARK Employment Security Division, P.O. Box 34047, Little Rock, Arkansas 72203.**

AUSTRALIA
ROYAL MELBOURNE INSTITUTE OF TECHNOLOGY LIMITED
SENIOR LECTURER/LECTURER
DEPARTMENT OF COMPUTING

The department offers a broad teaching programme in Computer Science. Major current research activities include: data base management, computer hardware and software architecture, computer data communications, compiler construction and artificial intelligence. The Institute supports interaction with industry through consultancy and education.

Applicants should have an appropriate tertiary qualification and experience in two or more of the following areas (alphabetical order): artificial intelligence, commercial computer applications, computer architecture, computer based data communications, computer graphics, computer hardware, computer networks, control systems, digital logic, operating systems, real-time applications programming, robotics, scientific mathematical, engineering applications, software engineering, systems analysis and design.

Salary within the ranges:

Senior Lecturer	**$A30,096 - 35,077 per annum**
Lecturer	**$A22,430 - 29,467 per annum**

The position is tenured.

Position description available from Staff Branch, RMIT Ltd., Box 2476V, GPO Melbourne 3001, Australia.

Applications quoting reference number 128/18/AN to Staff Officer at above address by March 18th, 1983.

RECON CENTER MANAGER

Excellent opportunity for a qualified individual to set up manage recon/refurb center.

Area of responsibility is general office management including audits, inventory control and all facets of recon/refurb. Familiarity with payroll and general accounting functions is highly desired.

The successful candidate will have 5 years' industry experience and strong knowledge of IBM I.O., CRT's, 4300, System 3 and Series I in addition to experience with billing procedures and IBM M/A policy. The candidate we seek will have earned a minimum of $30K annually for the past two years.

Salary is open. Incentives plus excellent benefit package.

For consideration, qualified individuals may submit resume, outlining salary history, to:

CW-B4073
Computerworld
Box 880
Framingham, MA 01701

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SENIOR PROGRAMMER/ANALYST
HP-3000

Major midtown NYC communications company requires a Senior Programmer/Analyst with Systems Analyst potential to lead 1983 conversion from a COBOL batch environment to an HP-3000 on-line configuration including implementation of Software International packages. Three years applicable experience required, COBOL, IMAGE, QUERY and Financial application experience highly desirable. Salary competitive; dependent on qualifications; excellent benefits including Profit Sharing. Confidentiality assured. Forward resume with salary history to:

CW-B4070
Computerworld
Box 880, Framingham, MA 01701

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SYSTEM ANALYST

Large local mfg. is expanding their DP dept. Excellent growth oppty. for the indiv. with IBM, COBOL, or PL/1. Move up.

Salary $25-27K

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ROBERT HALF
OF DAYTON, INC.
First National Plaza
Dayton, Ohio 45402
Lic. DAPC Member

Oak Park, IL.(54,887),

Police-Management Information Systems Supervisor
$22,000-$29,000.

Responsible technical and administrative work in supervising the Police Record Bureau and developing and maintaining an automated Management Information Systems. Conduct systems analysis, oversee mandated reports. Basic familiarity with computer hardware and software required. Graduation from college with training and experience in statistics, accounting and data processing. **Resume to Personnel Director, Village of Oak Park, 1 Village Hall Plaza, Oak Park, Il. 60302.**

UT Martin

Applications are invited for one computer science and one half computer science/half math position; tenure track; begin Sept. 83. Computer/information science or math with computer emphasis is preferred. M.S. with demonstrated ability to teach & plans to complete a terminal degree will be considered. Salary dependent upon qualifications. Primary responsibility will be teaching 12 qtr hours of undergraduate courses, academic advising of students, and curriculum development. Computing facilities include PDP 11/70's, several micros, and remote entry to IBM 3031 and DEC 10 at UT Knoxville. Send by March 1, 1983 resume, transcripts, and 3 letters of reference to **Dr. Bill Austin, Dept of Mathematics and Computer Science, The University ot TN at Martin, Martin, TN 38238-5049.** Representative will be at ACM conference in Orlando. UTM is an equal opportunity/affirmative action employer.

SYSTEMS PROGRAMMERS
$25K to $50K
PROGRAMMERS/ANALYSTS

Familiarity with any of the following:

- PL/M, PL/Z, PASCAL, UNIX/C or CP/M operating systems. 2-8 yrs. exp. Degreed.
- Install & maintain UNIX, DEC & 3rd party software. Analyze & improve VAX performance.
- Mathematical modeling. Software development.
- Minis/Micros, Real Time controls
- Software Dev'lt. Exp. in applications dev'lt utilizing UNIX/C.
- Robotics & process machine control
- Write software graphic packages

This is a partial list of more than 1000 current openings we have listed with us. Fees & relocation expenses company paid. Call/send resume: DEPT. C-B.

J. Rogers (609) 771-8282
JANE ROGERS ASSOC.
2999 Princeton Pike
Lawrenceville, N.J. 08648

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Florida's financial community is Booming!!
Our clients need your expertise.

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BAL, FCL, 3600, ATM's	To 28K
OS/MVS, PL1, Cobol	To 27K
Univac 1100, Assembler	To 28K
DOS or OS, trust, deposits, credit card, check processing, savings, loans	To 30K
CICS (Macro Bal & Command)	To 32K

SOFTWARE PROGRAMMERS

MVS, VSE, VM, CICS	To 33K
IMS DB/DC, ACF/VTAM	To 33K
IMS Data Base Analyst	To 32K

Call or send resume.
Other positions available.

AVAILABILITY, INC.
813/872-2631
Dept. C., PO Box 25434
Tampa, Florida 33622

COMPUTER GRAPHICS

Key product management opportunity at SOHIO's Scientific Computing Facility

If your experience encompasses highly sophisticated graphics applications, your next career step could be The Standard Oil Company (Ohio). Our Cleveland Scientific Computing Facility features CDC Cyber 175, 760 and 205 gear, and uses major graphics software packages — **DI-3000, MOVIE.BYU, CPS-1, SGL/SDL and CD-2000.**

We are actively seeking a technically skilled computer graphics specialist to be part of our growth activities associated with graphics software product management. Your qualifications must include:

- **BS degree in a technical field, preferably with an MS in Computer Science (or related technical area), and work experience on a CDC Cyber 175 and/or 760 using major graphics software packages mentioned above.**
- **Demonstrated ability to consult with minimal supervision in a highly dynamic environment.**
- **4-5 years' practical experience with various computer graphics terminals and software, preferably petroleum engineering- or exploration-related.**
- **Excellent oral/written communication skills and the ability to work effectively with senior technical and managerial people as well as graphics users.**

As our Computer Graphics Product Manager, you would maintain state-of-the-art knowledge of graphics software and hardware technology to provide ongoing consulting support to SOHIO's diverse graphics user community. You would also have complete responsibility for the rapidly expanding graphics products library on our CDC Cyber computers.

We offer an excellent salary commensurate with experience, comprehensive benefits and an opportunity to work with some of the industry's most advanced technical people in an environment of teamwork and individual growth. **SOHIO's relocation package for new hires who are homeowners includes a mortgage interest differential allowance, third party home purchase option, and other features often restricted to internal transfers.**

For immediate, confidential consideration, send your resume detailing your career experience and current salary history to:

Sarah Steiner,
Senior Executive
Recruiter
THE STANDARD OIL
COMPANY (Ohio)
1424 Midland Building
— 482 (CW)
Cleveland, Ohio 44115

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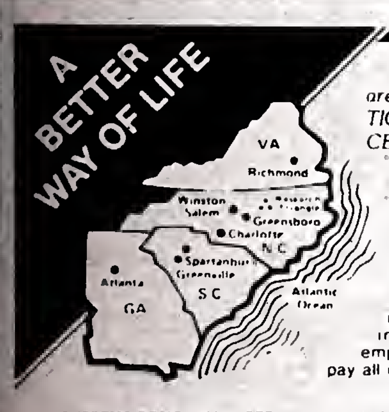
NO THIRD PARTY INQUIRIES, PLEASE.

"Help us Help to Assure America's Energy Future"

SOHIO



OUR CLIENTS

are the leading NATIONAL and INTERNATIONAL corporations with major DATA PROCESSING CENTERS in NC, SC, So VA, No. GA. They offer "state of the art" TECHNOLOGY, excellent WORKING CONDITIONS, outstanding FRINGE BENEFITS and nationally COMPETITIVE SALARIES

WE ARE PROFESSIONAL RECRUITERS

We are paid by our company clients to assist them in identifying the talent required for their continuing growth. Your presentation to a potential employer is personal and confidential. Our clients pay all interview and relocation expenses

SYSTEMS DESIGN MANAGER to $40K
4 yr degree (MBA a plus). Min. 10 yrs exp. in systams analysis and dasign of business systems utilizing data bese and telecommunications technology in a large IBM mainframe environment.

SR. TECH ANALYST to $39K
Min. 2 years in MVS performance monitoring and tuning with thorough knowledge of MVS generation and mainlanance. Experience with IMS, VM and capacity planning a definite plus.

SOFTWARE ENGINEER to $39K
BSEE. Min. 5 years experience in software design of commercial applications for microprocessor based products. Familiar with software/hardware tradeoffs, layered systems architecture, operating systems definition, Assembler and Pascal coding.

SYSTEMS SALES REPRESENTATIVE to $39K
MBA (undergrad degree in engineering or physical science preferred). Min. 5 yrs exp. in sale of microprocessor based industrial equipment or for fleet managemant service bureau required. Ability to write and make proposals.

PROGRAMMING MANAGER to $35K
4 yr degree. Min. 10 yrs in management of financial systems development in a medium to large scale IBM mainframe anvironmant. Strong COBOL programming and DOS/VSE background.

COMPUTER ANALYST to $33K
College degree. Min. 5 yrs in large mainframe IBM OS/MVS anvironment. Must have strong background in: business systems design, COBOL programming, IMS DB/DC date dictionary, methodology and standards.

LEAD SYSTEMS ANALYST to $32K
Computer Science degree preferred. Min. 8 yrs DP exp. with 3 yrs COMMERCIAL & INSTALLMENT LOAN and 2 yrs project/people managament experienca in large mainframe IBM OS or MVS environment required.

SYSTEMS ANALYST to $32K
Min. 5 yrs in systems analysis and design of business systems in large mainframe IBM environment. Oral and written communications skills

ANALYST/PROGRAMMER to $32K
College degree. Min. 3 yrs in systems design and programming of process control or manufacturing systems in FORTRAN and/or COBOL on DEC PDP-11 or VAX computers.

ANALYST/PROGRAMMER to $32K
Min. 5 yrs in analysis, design and COBOL programming of businass systems in large mainframe IBM anvironment. Familiarity with OS/JCL, VSAM, CICS, DL1 or IMS a must

PROGRAMMERS to $29K
Min. 3 yrs axp. programming in COBOL utilizing OS/JCL, VSAM, CICS. Familiarity with DMS or Data base systems a plus

ANALYST/PROGRAMMER to $26K
Min. 3 yrs exp. in design and programming (COBOL) of menufacturing applications. Univac 90 series, UNIS experience a plus.

OPERATIONS SUPERVISOR to $26K
Hands-on operations (UNIVAC 90 series computer preferred) with maintenance programming (COBOL) capability. Demonstrated organizational/managemant skills and experience

WE PRACTICE AFFIRMATIVE ACTION

Call 1-919-378-9894 or write (please include current resume; salary history; career, salary & geographic objectives). U.S. Citizens or Permanent Residents only.

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personnel consultants P O BOX 6788 • GREENSBORO, N C 27405

IMS **CICS** MVS

Can you meet the challenge at OSI?

On-Line Software has recently become a public corporation. We are continuing to expand rapidly, and want to attract the most talented people in the industry for our Products, Consulting and Education divisions:

- CICS & IMS systems and applications consultants & educators
- Product development & support personnel
- System Programming specialists

We need more people to uphold OSI's standard of excellence. With over two hundred employees and fourteen years of experience, OSI is well known for its:

- Famous CICS & IMS handbooks ('The Bible' - both Testaments)
- State-of-the-art software products such as InterTest™ and Guardian™
- Highly respected consulting and education services (CICS, IMS, VTAM, VSAM, management consulting)
- Outrageous buttons at trade shows

If you have at least 5 years of intensive DP experience, with at least 3 years of CICS, IMS, or System Programming expertise, and you think you are qualified for a highly challenging and rewarding career at OSI, send us a resume or an informal summary of your skills and experience. All replies will be held in the strictest confidence. All openings are for the Fort Lee, NJ area, overlooking the George Washington Bridge to NYC. No agencies, please.

Send resumes to:

ON-LINE SOFTWARE INT'L
Fort Lee Executive Park
Two Executive Drive
Fort Lee, New Jersey 07024
Attn: Technical Hiring Team

(201) 592-0009 / (800) 526-0272

PROJECT LEADERS - and - PROGRAMMERS/ ANALYSTS

AUXCO, a prestigious and progressive software proprietor and consulting organization, specializing in the telephone communications industry, currently has several immediate opportunities for "professionals" possessing the following background:

• PROJECT LEADERS

Candidates MUST possess solid leadership experience with technical background in COBOL IMS or PL/1 IMS.

• CICS Programmer/Analysts

Individuals must possess 2-5 years experience programming on-line systems.

• IMS DB/DC

Solid working experience designing DB/DC based systems. Candidates should be familiar with COBOL and/or PL/1 in an IMS Database environment.

We offer selected applicants competitive starting salaries and comprehensive benefits. For consideration, send resume stating salary history and requirements to:

JAN ACKERMAN
AUXCO
Auxton Computer Enterprises, Inc.
201 East Pine St., Suite 210
Orlando, Florida 32801
an equal opportunity employer

SENIOR CAPACITY PLANNER

The qualified applicant will have technical understanding of large scale hardware and software computer systems and communication networks. Must have recent experience in MVS enviroment at the current level of hardware/software technology. Experience required in computer performance measurement forecasting using such aids as RMS/SMF, SAS and Modeling. Good written and verbal communication skills are an intergral part of the position. Proven record in Capacity Planning and prior Systems Programming would be the ideal background for this position.

We offer competitive salary, excellent benefits and outstanding career opportunities.

Send resume to:
Federal Reserve Bank of Dallas
Personnel Department
Station K
Dallas, TX 75222

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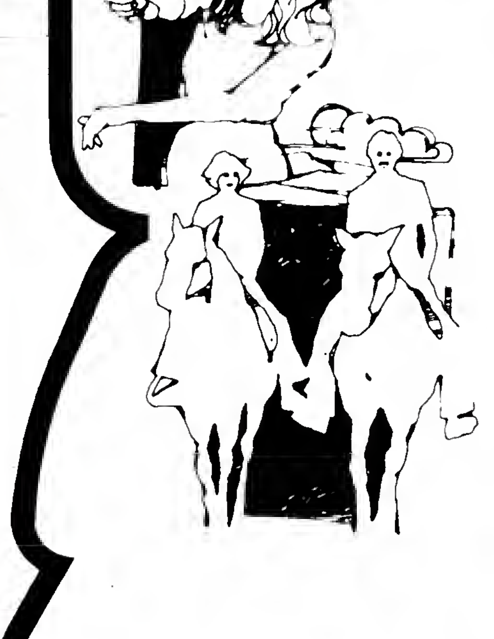
FIND YOUR FUTURE IN PHOENIX



As one of the fastest growing cities in America, Phoenix boasts excellent schools, top cultural attractions, professional sports and easy access to outdoor recreation.

And at Arizona Public Service Company, we talk careers. As the state's largest utility supplier, we offer excellent career potential in the following positions:

COMPUTER ENGINEERS
Successful candidates must have DEC/RSX 11, HW/MOD 400, SEL/RTM and/or MODCOMP/MAX 4 software experience.

COMPUTER TECHNICIANS
Requirements include a minimum of 2 years experience including chip level repair on one or more of the following systems: SEL 32/55, MODCOMP Classic, Honeywell L-6, and 4500, CDC 1820, and PDP/11 Series.

In addition to unlimited growth opportunity we are highly competitive in salaries and benefits. To find your future, take the first step by sending your resume to:

Mr.Charles Kilzer
ARIZONA PUBLIC SERVICE COMPANY
P.O. Box 21666,
Station 6145, CW0131
Phoenix, Arizona 85036

APS.

An Equal Opportunity Employer

INTERNATIONAL ATOMIC ENERGY AGENCY
SENIOR TELEPROCESSING SYSTEMS PROGRAMMER

The International Atomic Energy Agency, an organization in the UN family, seeks a highly experienced Senior Systems Programmer as Teleprocessing Expert for its Computer Services Section - Systems Group. Required university degree plus 10 years' relevant practical experience in data processing or 15 years' relevant practical experience in data processing of which, in both instances, 5 years must be **recent** systems programming experience in a large IBM MVS environment and experience with TSO and CICS. Some working experience in technical project management, current telecommunication technology, computer architecture and programming languages are also prerequisites.

Presently, the Agency has a dual IBM 3081/3032 MVS/SP plus JES2 configuration with ACF/VTAM, TSO/SPF, CICS, STAIRS and ADABAS and provides a variety of computer services to the UN organizations based in Vienna, as well as world-wide networks for information retrieval.

Initial contract for two years, tax-free emoluments depending on experience and qualifications approx. $38,000 - 41,000. Additional allowances for dependents. Travel and removal expenses paid. Six weeks annual leave.

Send Curriculum Vitae with an indication of your nationality under Vacancy Notice No. 4/83 to the Division of Personnel, International Atomic Energy Agency, P.O. Box 100, A-1400 Vienna, Austria.

COLD WEATHER DOLDRUMS?
FLORIDA!
SYSTEMS PROGRAMMERS

Richard Maddock and Associates, Personnel Consultants to the Data Processing Industry have large, modern, technically sophisticated clients located in the SUNSHSINE STATE with requirements for:

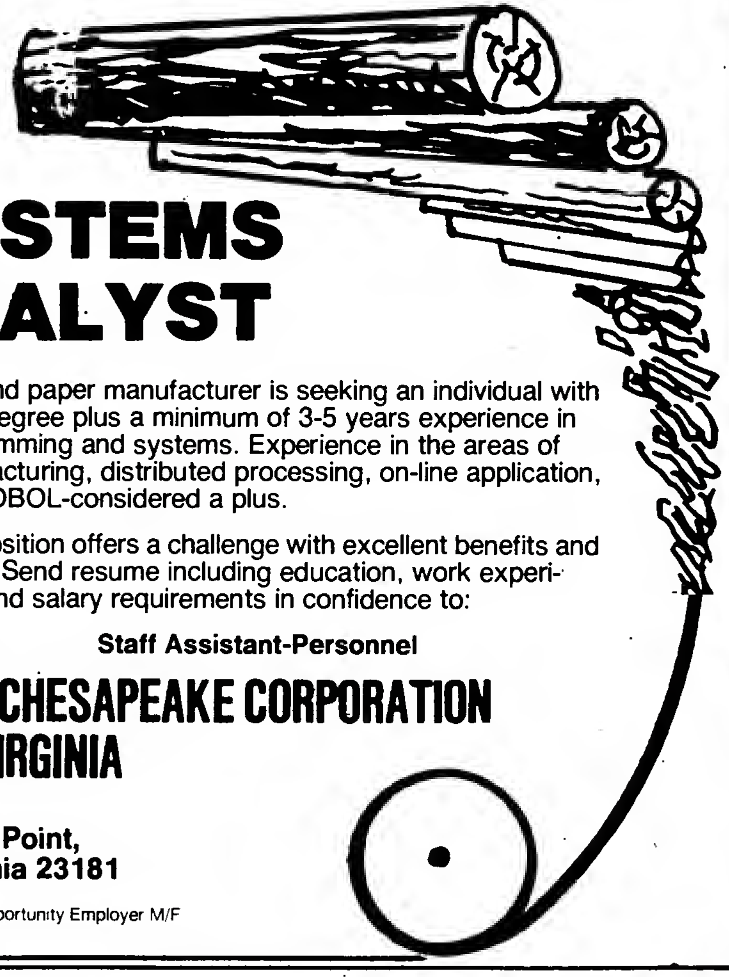
OPERATING SYSTEMS SOFTWARE SPECIALISTS

in the areas of:

*** DATA COMMUNICATIONS or**
*** COMPUTER PERFORMANCE MEASUREMENT or**
*** OPERATING SYSTEMS SUPPORT.**

Experience with IBM, DOS/VS or MVS or VM/370 or IMS or CICS or VTAM or 3705 and ASSEMBLY LANGUAGE are desirable. Our clients offer top salaries and a perfect climate for year 'round recreation. Please send resume or call (to 8 p.m. E.S.T.)

RICHARD **MADDOCK** AND ASSOCIATES, INC.
Personnel Consultants / **Phone (813) 933-5838**
P.O. Box 271431 / **Tampa, FL 33688**



SYSTEMS ANALYST

Pulp and paper manufacturer is seeking an individual with a BS degree plus a minimum of 3-5 years experience in programming and systems. Experience in the areas of manufacturing, distributed processing, on-line application, and COBOL-considered a plus.

This position offers a challenge with excellent benefits and salary. Send resume including education, work experience and salary requirements in confidence to:

Staff Assistant-Personnel

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Equal Opportunity Employer M/F

Computer Programmer/Analyst Position at Lassen College/ Susanville, CA

Qualifications: 4 years COBOL programming experience or education equivalent to graduation from a 4 year college. Salary range $1,854 to $2,270 per month plus benefits. Last day to apply is March 4, 1983. **Contact Mary Berry, Lassen College, P.O. Box 3000, Susanville, CA 96130, (916) 257-6181, ext. 120.**

Affirmative Action Title IX Employer

PROGRAMMER/ANALYST

Commodity/Wall Street experience helpful. New York city area.

Send resume and salary requirements.

Reply to CW-B4072
Computerworld
Box 880
Framingham, MA 01701

Consider A Career Change

If you have significant experience in software development why not teach? St. Mary's College has a growing Applied Computer Science program and needs you. Requirements are a Master's Degree, a practical knowledge of the computer field, a liking for young people and a desire to see them receive the best possible education. You can enjoy great freedom building new state-of-the-art courses. You can direct your energy towards projects of your own choosing. This position begins in the Fall of 1983. We are absolutely an Affirmative Action and Equal Opportunity Employer. We want the best for our students. If this is the opportunity you've been seeking send a letter and brief resume to:

Paul Schumacher
Box 56A
St. Mary's College
Winona, MN 55987

PROGRAMMER

Vinnell Corporation, an international technical services contractor, seeks a programmer with a minimum of 2 years experience with RPG and COBOL in an online data base environment. IBM/System/38 experience highly desirable.

For more information about this challenging opportunity, please send your resume including salary history and requirements to Rick Kraft, Vinnell Transportation Center, 222 E. Redwood Street, Baltimore, Maryland 21202.

VINNELL
VINNELL CORPORATION

The Vinnell Corporation is an Equal Opportunity Employer M/F/H/V

TECHNICAL SUPPORT SPECIALIST II
Salary range: $31,204 - $36,505

Oakland County is currently seeking candidates for key technical positions in Systems Programming. The Computer Center houses two IBM 4341 Processors utilizing DOS/VSE, VM/CMS, VSAM, IDMS, SNA and an on-line network of over 350 terminals. Applicants must possess a Bachelor's degree in Computer Science, Data Processing or a closely related field **AND** have 5 years of experience in programming and/or systems analysis, including at least 2 years of software experience (additional experience may substitute for the Bachelor's degree).

For further information or application package, please contact the Personnel Department:

Oakland County
1200 N. Telegraph • Pontiac, MI 48053
(313) 858-0530
An Equal Opportunity & Affirmative Action Employer

COUNTY OF OAKLAND MICHIGAN

Daniel T. Murphy, County Executive

DATA PROCESSING MANAGER

Florida-based Regional airline is seeking a qualified Data Processing Manager to oversee their entire computer operations.
Responsibilities include managing and operating our in-house computer facility; interface with other on-line systems; initiating and maintaining plans that are responsive to our needs; system evaluation, analysis and design, programmming and technical support.
Qualifications: Minimum five years experience with DEC PDP 11/44 equipment and familiarity with RSTS/E, BASIC PLUS, and DIBOL. B.A. required; M.A. preferred. Salary and fringes commensurate with experience.
Reply in confidence to:

COMPUTER SEARCH
PBA
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Fox-Morris specializes in the placement of all programmers and systems analysts. Our present openings are with Top Fortune 500 companies with special emphasis on NEW START-UP opportunities on a local and regional basis. For a clear understanding of our client's needs and to know your true value in todays market, call Robert Montgomery at 919/872-2940 or send resume to

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Denver, Colorado

Sohio's Exploration computing staff has a major challenge for a talented individual in Systems Design. We need to combine data from several data bases into a functioning interactive program that our Geologist and Geophysicist users can use to efficiently explore for oil and gas in the vast Rocky Mountain Area.

Several important problems need to be analyzed and solved to achieve our goal of accurate maps. Challenging problems of data flow, plotting, and graphics display will test the limits of your abilities.

We require a specific background that includes 4 years of programming in FORTRAN with extensive use of plotting equipment and graphics display. Work/academic experiences with interactive data bases and/or oil and gas applications would be very helpful. A Bachelor's or advanced degree in Computer Science, Mathematics, Engineering, or Earth Sciences is a definite plus. We run VAX 11/780 so any DEC experience will be positively viewed.

In addition to being a part of a successful enterprise, you will qualify for a compensation package including a highly competitive salary and excellent employee benefits. Qualified individuals will have access to our transfer policy which offers new hires many features that other firms reserve only for transferring executives. Please respond by sending a detailed resume to H.R., Sohio Petroleum Company, R7160, 633 17th St., Suite 2200, Denver, CO 80202. Preference will be given to resumes sent by individuals while those referred by employment agencies will be held for later review.

SOHIO

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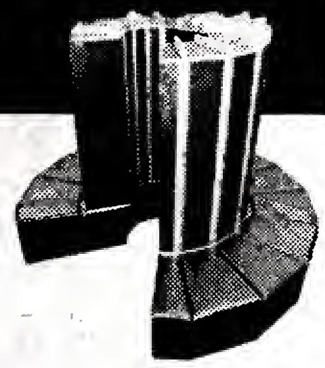
SR. PROGRAMMER ANALYSTS
Field Liaison/Support



An acknowledged leader in supercomputers, CRAY RESEARCH seeks individuals with at least 3 - 5 years operating systems internals support or development experience in the following areas: VAX/VMS, MVS, VM, NOS/BE, NOS.

Based with our central support group in Minneapolis/St. Paul, your responsibilities will include installing and supporting our station software services, logically linking front-ends with CRAY equipment. Up to 30% domestic and overseas travel is involved.

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Elisabeth C. Wierum
Department 131
CRAY RESEARCH INC.
1440 Northland Drive
St. Paul, MN 55120

The Supercomputer People

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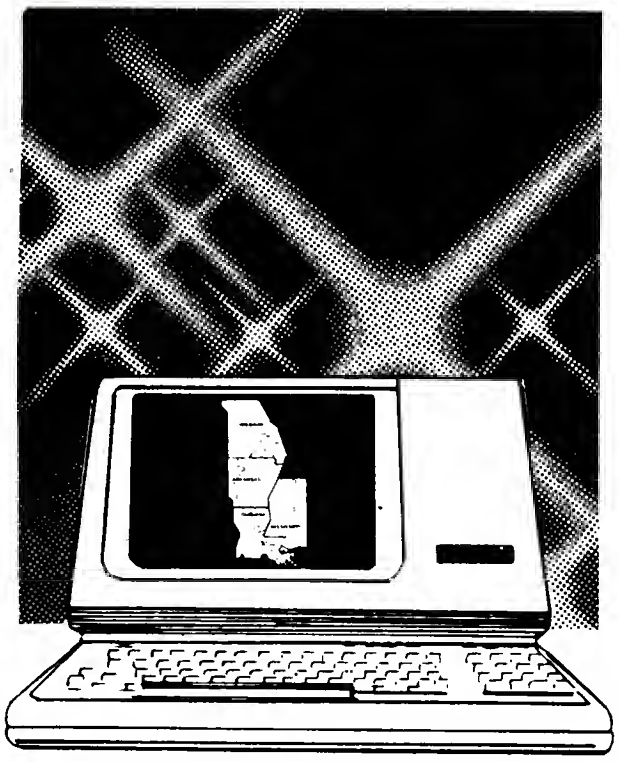

It's Middle South Services, Inc., the specialized technical service arm of the Middle South Utilities System. We're the sixth largest electric utility in the nation, applying the latest innovations in energy throughout portions of Louisiana, Arkansas, Mississippi and Missouri. The ongoing success of network is contingent upon the sophisticated systems support of our advanced EDP environment.

High-calibre professionals now have the opportunity to apply their expertise within this unique environment, which consists of two IBM 3081's and Tandem mini-16's. If you have top skills, an innovative sensibility and the capabilities to effectively utilize PL1, COBOL, FORTRAN, Assembler, IMS DB/DC and CICS(MACRO), then you can qualify to join the network that powers the South.

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Working with user personnel, you'll determine information requirements and operational needs, as well as aid in planning, defining, analyzing and implementing business systems. Requires 2+ years experience as a Systems Analyst along with a thorough understanding of the logical design in IMS DB/DC. Knowledge of ADF, Data Dictionary concepts, Mark IV, Panvalet would be a plus.

ANALYST PROGRAMMERS

The ideal candidates would possess 3+ years experience with COBOL, IMS DB/DC, plus 3 years experience with Business Applications or plant maintenance systems. Knowledge of ADF, Data Dictionary concepts, Mark IV, Panvalet would be a plus.

ANALYST PROGRAMMERS (SCIENTIFIC/PLANNING)

Positions calls for an individual capable of developing information systems specifications, as well as estimating, coding, testing and documenting scientific/planning oriented computer problems. You must possess knowledge of COBOL and CLIST. Experience with a variety of modeling applications helpful. Knowledge of FORTRAN and/or PL1 a plus.

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Openings exist in the General Accounting and Financial areas for experienced Project Leaders.

The FINANCIAL PROJECT LEADER position calls for an individual with a background as a Senior Systems Analyst and/or Project Leader Administrative/Accounting Systems such as accounts payable. Technical background in a IBM environment with large system maintenance responsibility is required; formal study in accounting principles is desirable. PL1 and IMS experience helpful, though not required.

THE GENERAL ACCOUNTING PROJECT LEADER position requires a background in maintaining and developing large general ledger systems in a Senior Systems Analyst or Project Leader capacity. Technical background should include large systems maintenance in a IBM environment which utilized PL1 language. Coursework in finance/accounting highly desirable.

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LOGIC DESIGNERS-CONTROLLERS: Minimum of 5 years logic design experience. Expert knowledge of logic design, microprocesor, based designs, firmware, peripheral equipment interfaces, computer channel interfaces and host peripheral software handlers/drivers. Requires strong background in working with comtemporary LSI devices and MPU development systems as well as "hands-on" experience with logic analyzers, scopes, and in-circuit emulators. MSEE or MSCS required.

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Qualex offers an excellent benefits package. Please send resume to:

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Increasing development of data processing support for both preclinical and clinical research has generated new career opportunities in two neighboring locations of our company. Distinguished scientific staff and the most advanced instrumentation make pharmaceutical R&D a clear competitor to other user industries available to the scientific computer specialist today.

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Based in the Clinical Research function of our headquarters location, this key position requires knowledge of the total clinical research process, related statistical methods and F. D. A. regulations, and FORTRAN and BASIC. This will enable the successful candidate to supervise design, programming and implementation of a comprehensive Medical Information Management System, including supervision of two staff programmers and contract personnel as required. Knowledge of Hewlett Packard 3000 Computer System, specifically Image 3000, Query 3000, and View 3000 definitely required.

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Located in the Research and Development Center itself, this position provides hardware and software support for all minicomputers in the Center, together with present Scientific Programmer Analyst. Multiple hardware includes HP 9845, 85, 86 and 1000 and Wang 2200 MVP and Alliance. Additional multiprogrammer data systems are interfaced to these computers. Specialized knowledge should include biological (specifically animal) research, related statistical methods for experimental planning and analysis, and FORTRAN and BASIC.

Both positions require an advanced degree or equivalent, at least one degree being in a science or mathematics. In both, knowledge of German would be beneficial. Both report to the Manager, Scientific Systems.

Our attractive, advanced technical facilities are located about 60 miles from New York City in midwestern Connecticut. We offer a competitive compensation/benefits package, including assisted relocation, with the advantages of a stimulating and high visibility working environment.

For confidential consideration, please send resume with salary requirement to:

Stuart E. Rapp, Personnel, R&D

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VS/9 Systems Analyst

Sperry Univac has an immediate opening for a Systems Analyst experienced in the Series 90 VS/9 operating system. Experience with Sperry Univac Series 90 VICAM and IMS and knowledge of Sperry Univac 1100 Systems is also a plus.

This opening exists in our Major Systems Marketing Support organization located in a suburban Minneapolis/St. Paul area which has an in-house multi-system facility used for demonstrations to the domestic and international marketplace. This is a dynamic marketing environment where you will enhance your experience by working with a wide range of Univac's most current product line.

Qualifications include 3-6 years programming/analysis experience, the majority of which has been with VS/9. The non 1100 analyst will be cross-trained on the 1100 Systems. Degree is desirable but not mandatory. The successful candidate will also possess the willingness and ability to interface with customers and various levels of Sperry Univac personnel.

FOR IMMEDIATE CONSIDERATION, DIRECT YOUR RESUME AND SALARY REQUIREMENTS TO:

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SPERRY UNIVAC
P.O. Box 3525
St. Paul, MN 55165

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DBA	IMS/TOTAL/IDMS	To 35K
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1-800-528-0446
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Western New Mexico University

Two tenured track positions (Assistant or Associate Professor) in the College of Science and Mathematics. The successful candidate must be able to instruct at the undergraduate level in Computer Science and Mathematics. Normal teaching load is twelve credit hours per semester. Opportunity is also available to teach in summer sessions for extra compensation. University emphasis is on quality teaching. Doctorate in related area required. Salary negotiable. Application deadline is March 1, 1983.

Please forward a letter of application, resume, three letters of recommendation and telephone access for references and previous supervisors to the Office of Personnel/EEO, Box 17 - Western New Mexico University, Silver City, NM 88062. Telephone (505) 538-6328. For further information, contact Dr. Kenneth H. Ladner, Dean at (505) 538-6227.

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Albuquerque, NM 87110

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Perform detail program design, coding, implementation, and maintenance for financial systems. Must be experienced in NCR, NEAT/3, and COBOL. Knowledge of CIF loan applications helpful. Competitive salary and excellent fringe benefits. Send resume in confidence to: **Personnel Manager, National Bank of Commerce, P.O. Box 6208, Pine Bluff, Arkansas 71611.**

Equal Opportunity Employer

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Boston based microcomputer software publisher has an immediate opening for a Product Development Manager in its professional software division. Our existing product line includes comprehensive statistics, graphics, forecasting and operations research programs with planned expansion into financial/accounting markets.

Duties include: supervision of the ongoing development of existing product line, management of in-house product-support personnel, identification of new market and product opportunities, and product training of marketing representatives.

Applicants should have extensive experience with microcomputer and mainframe applications software packages, excellent organizational and communciation skills, plus a sound understanding of marketing. A degree in statistics or a related area, or equivalent work experience is desirable.

As a member of one of the world's largest information organizations, we offer excellent compensation and fringe benefits. To learn more about this exceptional career opportunity, send your resume and salary requirements in confidence to:

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More computer people read Computerworld than any other newspaper in the United States - more than half a million computer people every week.

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**•IGDS Specialist •ARTEMIS Experts
•IDMS Analyst/Designer**

We're P-E Computer Services Inc., a leading software house providing multi-discipline data processing teams to clients the world over. Due to expansion, we are seeking the following professionals for 1 year contract assignments in South America where pleasant living conditions and climate prevail.

IGDS Specialist: Intergraph systems support programmer with extensive knowledge of this product will be required to install new releases and support users. An engineering background, especially piping design would be preferable, as would knowledge of Spanish.

IDMS Analyst/Designer: Must have been directly involved in a major project from inception to implementation. Thorough knowledge of IDMS methodology and problem solution is vital. Will provide analysts and programmers with training and support in all aspects of this DBMS. Spanish language useful.

ARTEMIS Experts: To provide central support to various user groups. **Must** be capable of answering any questions and providing solutions to any problem in Spanish.

You will be compensated with salaries and benefits that reflect the importance of these positions such as high tax free earnings, local living expenses, medical insurance, a vehicle and single or family status. For immediate consideration please forward your resume to: **P-E Computer Services Inc., Ashford Bank Building, 1035 Dairy Ashford, Suite 300, Houston, Texas 77079 or call (713) 556-9513.** We are an equal opportunity employer.

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PE

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We want the chance to discuss how your experience fits you for one of these positions:

- **Telecommunications Specialist**
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- **Data Management**
  - -Data Analyst
  - -Database Specialist
- **Applications & End User Systems**
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You'll find a progressive work environment, a competitive salary, and a comprehensive benefit package here in our prime location in delightful Newport Beach. For immediate consideration, **phone Marsha Bridges collect at (714) 720-4556**, or mail your resume to her attention at: **Professional Placement, Dept. A762-001, Ford Road, Newport Beach, CA 92660.**

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Martin Marietta Aerospace

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COMPUTER PROGRAMMER/ ANALYSTS
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- **DATA BASE OPENINGS**
  Analyst, Design, Administrators with above hardware, software and applications experience.

These opportunities exist at our Michoud Assembly Facility located in suburban East New Orleans.

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Computer Professionals

At Pacific Gas & Electric Company, our Computer Systems and Services Department in our San Francisco headquarters provides a unique environment for you, the results-oriented, challenge-seeking Computer Professional.

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Your responsibilities may include planning, designing, and coordinating the implementation of our data communications network; installing and maintaining data communications program products, e.g. ACF/NCP, ACF/VTAM; and developing, installing, and maintaining utility software to support effective data communications operations.

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At PGandE, you'll enjoy superior benefits including paid medical/dental/vision, tuition reimbursement, a stock option purchase plan and a relocation package. Interested and qualified applicants are invited to send a resume and salary requirements to Executive Employment, Dept. DDA, 215 Market Street, 9th Floor, San Francisco, CA 94106, or call K. Snow, (415) 781-4211 x4438. Principals only, please. We are an equal opportunity employer.

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STRAIGHT TALK ABOUT CAREERS AT LINKABIT.

M/A-COM LINKABIT, INC. is a growing and exciting electronics manufacturer, presently looking for software engineers who write software tools. If your background includes any of the following, we'd like to talk to you.

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You'll work in an environment ranging from the DEC-20 to the IBM PC, using the whole spectrum of software engineering tools including cross-compilers, programs implementing file transfer protocols, symbolic debuggers, software documentation tools, etc.

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M/A-COM

M/A-COM LINKABIT, INC.
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Applications close: March 11, 1983
EOE/AA

Snow's

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Business application and utlity software development and distribution company, with 3,000 customers, marketing over 40 products through an international network of over 300 consultants. We are establishing a new division to direct the planning, promotion and implementation of management level end user seminars. We are looking for a Divisional Director who has:

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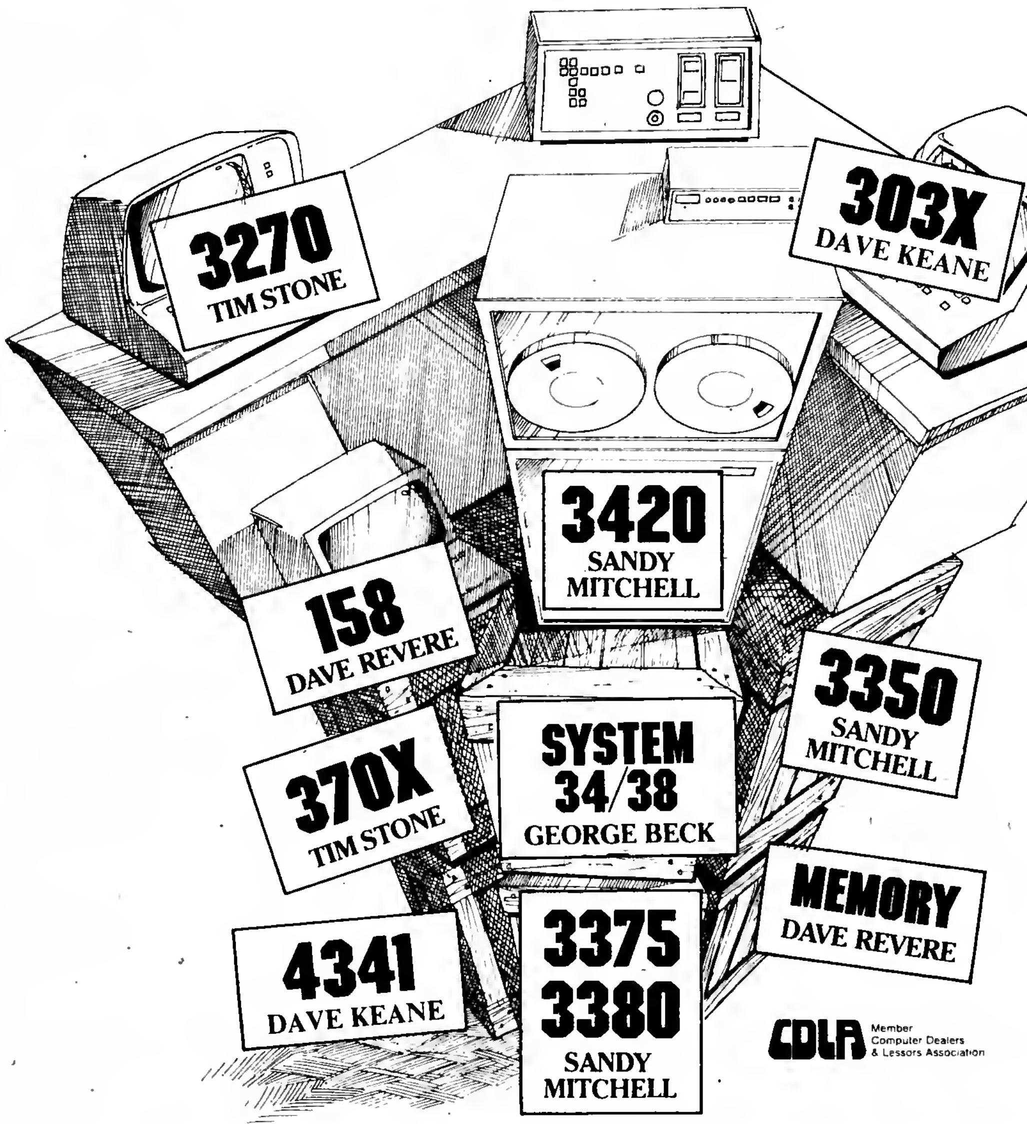

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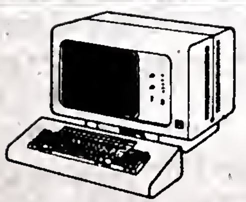

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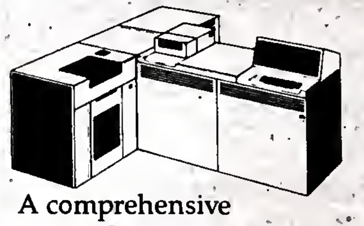

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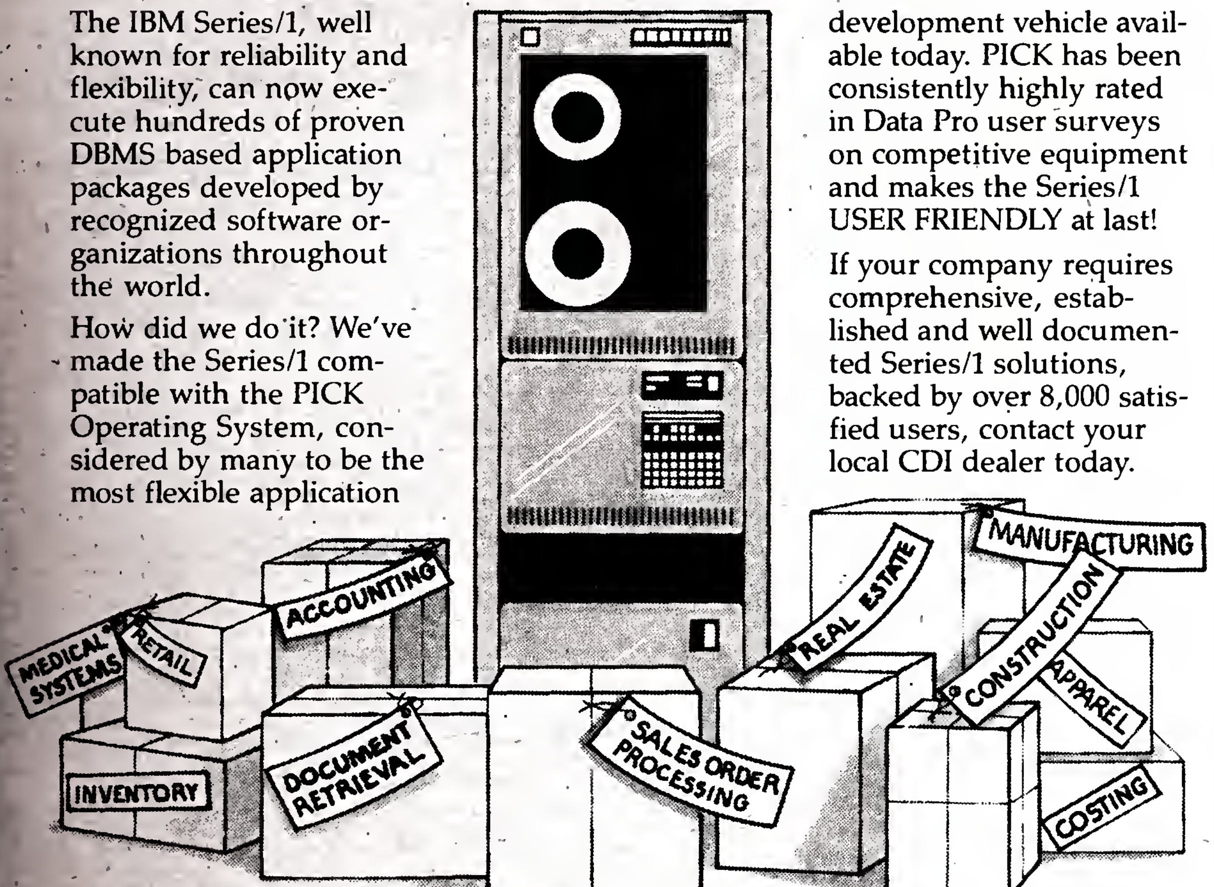

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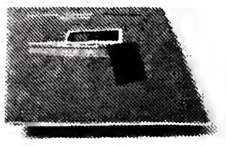

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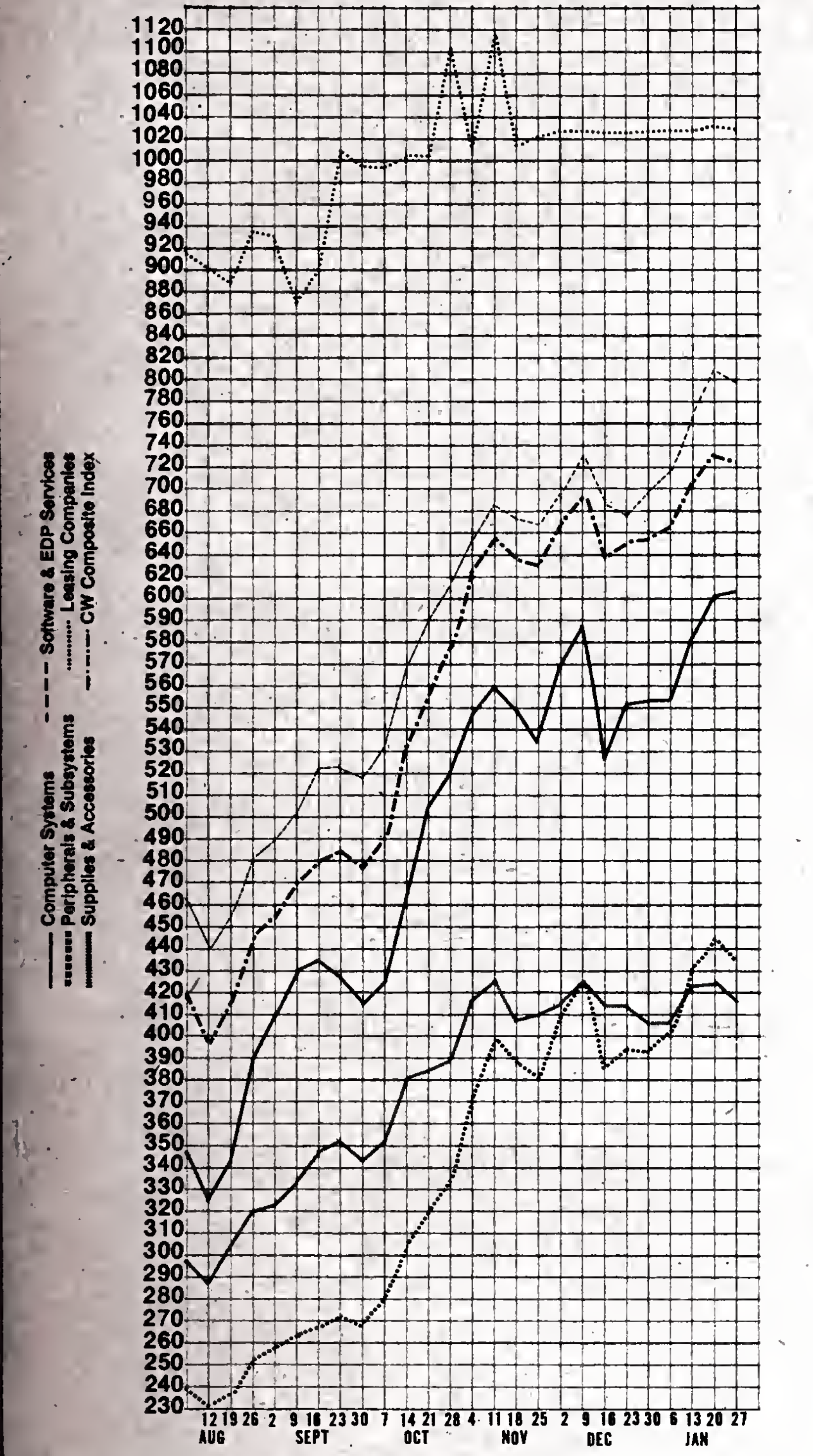

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COMPUTER SYSTEMS

EXCH		PRICE			
		1982-83 RANGE (1)	CLOSE JAN 26 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	17- 35	31 3/4	-1 3/4	-5.2
N	BURROUGHS CORP	28- 48	46 3/8	- 3/8	-0.8
O	COMPUTER AUTOMATION	7- 17	14	-1 1/4	-8.1
N	CONTROL DATA CORP	21- 43	41 7/8	+ 3/8	+0.9
N	CRAY RESEARCH INC	20- 45	40 1/2	- 1/4	-0.6
N	DATA GENERAL CORP	20- 59	45 1/2	-3 3/4	-7.6
N	DATAPOINT CORP	11- 54	21 1/4	- 3/4	-3.4
N	DIGITAL EQUIPMENT	62-116	115 7/8	+9 5/8	+9.0
A	EECO INC	6- 11	9 7/8	0	0.0
N	ELECTRONIC ASSOC.	5- 12	10 3/8	- 1/2	-4.5
N	FLOATING POINT SYST	16- 33	33 1/4	+3 1/4	+10.8
N	FOXBORO	22- 40	36 3/8	-2 5/8	-6.7
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	5 7/8	+ 3/4	+14.6
N	HARRIS CORP	20- 43	37 7/8	-1 1/8	-2.8
N	HEWLETT-PACKARD CO	36- 82	77 3/8	+ 1/8	+0.1
N	HONEYWELL INC	60-104	88 3/4	- 3/4	-0.8
N	IBM	48-100	95 1/8	-3 3/8	-3.4
O	IPL SYSTEMS INC	5- 9	7	+ 1/2	+7.6
O	MAGNUSON COMP SYSTS	2- 16	2 5/8	0	0.0
N	MANAGEMENT ASSIST	7- 18	11 7/8	- 3/8	-3.0
O	MINI-COMPUTER SYST	1- 4	5/8	+ 1/8	+25.0
N	MODULAR COMPUTER SYS	6- 13	11 3/8	- 1/2	-4.2
N	MOHAWK DATA SCI	10- 19	15 5/8	- 1/4	-1.5
N	NCR	39- 95	91	- 1/4	-0.2
N	PERKIN-ELMER	17- 33	30 1/4	-1 7/8	-5.8
N	PRIME COMPUTER INC	16- 41	39 3/4	-1 1/2	-3.6
N	SPERRY CORP	21- 37	35 1/2	+1 5/8	+4.7
O	TANDEM COMPUTERS INC	14- 34	28 1/8	+1 1/8	+4.1
N	TEXAS INSTRUMENTS	71-181	159 3/4	+7	+4.5
A	WANG LABS "B"	13- 35	32 5/8	-1 1/8	-3.3
A	WANG LABS "C"	11- 34	33	- 1/2	-1.4

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EXCH		PRICE			
		1982-83 RANGE (1)	CLOSE JAN 26 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	22- 30	28 1/2	- 1/4	-0.8
N	COMDISCO INC	13- 46	43 1/4	- 1/2	-1.1
B	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 20	16 3/4	- 1/4	-1.4
N	DPF INC	5- 13	10 5/8	+1	+10.3
O	ITEL	1- 5	5/8	- 1/4	-28.5
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 39	37 3/4	- 1/2	-1.3

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE			
		1982-83 RANGE (1)	CLOSE JAN 26 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 6	3 1/4	- 1/4	-7.1
O	ADVANCED SYSTEMS INC	9- 22	21	-1	-4.5
O	AGS COMPUTERS INC	7- 19	18 1/2	+2 1/2	+15.6
N	ANACOMP INC	9- 19	17 3/4	- 3/4	-4.0
O	ANALYSTS INTL CORP	5- 9	7 3/4	- 1/4	-3.1
A	APPLIED DATA RES.	16- 44	40	-3 1/4	-7.5
O	ASK COMPUTER SYSTEMS	12- 27	24 3/4	+1 1/4	+5.3
B	ASTRADYNE COMP IND	1- 5	3 1/8	- 5/8	-16.6
N	AUTOMATIC DATA PROC	21- 38	35	-1	-2.7
O	CGA COMPUTER ASSOC	5- 11	11 1/4	+1 1/2	+15.3
O	COMPUTER ASSOC INT'L	12- 40	39 1/2	+1 1/2	+3.9
O	COMPUTER HORIZONS	1- 3	9 1/2	-1	-9.5
O	COMPUTER NETWORK	4- 9	6 3/4	- 5/8	-8.4
N	COMPUTER SCIENCES	11- 20	17 1/4	-1	-5.4
O	COMPUTER TASK GROUP	8- 18	13 3/4	-2	-12.6
O	COMPUTER USAGE	2- 10	9 3/4	+3 1/4	+50.0
O	COMPUTONE SYSTEMS	13- 30	26 1/2	- 1/2	-1.8
O	COMSERV CORP	11- 20	17	+ 1/2	+3.0
O	COMSHARE	8- 10	8 5/8	- 3/8	-4.1
N	CULLINANE DATABASE	12- 33	31	- 3/4	-2.3
O	CYCARE SYSTEMS INC	9- 18	14 3/4	- 1/4	-1.6
O	DATA DIMENSIONS INC	1- 3	1/4	0	0.0
O	DATATAB	0- 4	5/8	0	0.0
O	DYATRON CORP	2- 4	3	0	0.0
N	ELECTRONIC DATA SYST	19- 50	47 3/8	- 1/8	-0.2
O	INFORMATICS INC	10- 24	22 1/4	+1 1/2	+7.2
O	INSYTE CORP	1- 3	2 1/4	+ 1/8	+5.8
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	6 3/4	0	0.0
A	LOGICON	12- 30	29 3/4	- 1/4	-0.8
O	MNGT SCI AMER INC	8- 28	23 1/4	-4 1/2	-16.2
O	MATHEMATICA INC	12- 20	17 1/2	-2	-10.2
O	MATHEMATICAL APP GRP	12- 19	18 1/2	- 1/2	-2.6
O	NATIONAL DATA CORP	13- 26	17 3/8	-1 3/8	-7.3
O	PANSOPHIC SYSTEMS	8- 21	20 1/4	- 3/4	-3.5
N	PLANNING RESEARCH	6- 13	11 7/8	- 7/8	-6.8
O	PROGRAMMING & SYS	1- 4	3 1/2	+ 1/2	+16.6
O	REYNOLDS & REYNOLD	17- 36	34 1/4	-1	-2.8
O	SEI CORP	21- 45	40 1/2	-1 3/4	-4.1
O	SHARED MEDICAL SYST	13- 28	25 1/8	- 5/8	-2.4
O	SCIENTIFIC COMPUTERS	6- 13	10 3/4	- 1/2	-4.4
O	SOFTWARE AG	5- 17	10 1/4	- 1/4	-2.3
N	TYMSHARE INC	12- 30	21 1/2	- 7/8	-3.9
A	URS CORP	10- 19	19	+1	+5.5
N	WYLY CORP	7- 13	10 7/8	- 1/8	-1.1

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE			
		1982-83 RANGE (1)	CLOSE JAN 26 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AM INTERNATIONAL	1- 15	2 1/2	0	0.0
A	ANDERSON JACOBSON	9- 26	21 1/8	-1 1/4	-5.5
O	AUTO-TROL TECHNOLOGY	8- 19	15 1/8	- 5/8	-3.9
O	BANCTEC INC	7- 33	17	-1 1/4	-6.8
A	BEEHIVE INT'L	4- 10	9 3/8	- 7/8	-8.5
A	BOLT,BERANEK & NEW	9- 35	34 5/8	+1 1/8	+3.3
O	CAMBEX CORP	2- 4	2	- 1/8	-5.8
N	CENTRONICS DATA COMP	6- 17	13 7/8	0	0.0
A	CETEC CORP	4- 7	6 1/8	- 1/4	-3.9
O	COGNITRONICS	2- 12	10 7/8	- 1/4	-2.2
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0
A	COMPUTER CONSOLES	15- 42	40 3/8	- 5/8	-1.5
O	COMPUTER DEVICES INC	4- 21	12 3/8	- 1/8	-1.0
O	COMPUTER TRANSCEIVER	4- 8	7	- 3/4	-9.6
N	COMPUTERVISION CORP	19- 38	38	+1	+2.7
N	CONRAC CORP	21- 36	32 1/2	- 1/8	-0.3
A	DATA ACCESS SYSTEMS	2- 5	3/4	0	0.0
A	DATAPRODUCTS CORP	16- 37	36	- 1/8	-0.3
A	DATARAM CORP	5- 11	10 3/4	- 1/2	-4.4
O	DATUM INC	2- 8	8 1/8	+1 7/8	+30.0
O	DAVID JAMISON CARLYL	2- 7	3 5/8	- 1/4	-6.4
O	DECISION DATA COMPUT	3- 14	11 5/8	+ 3/4	+6.8
O	DELTA DATA SYSTEMS	1- 3	2 1/8	- 1/8	-5.5
N	ELECTRONIC M & M	5- 8	6 1/4	- 5/8	-9.0
O	EVANS & SUTHERLAND	18- 48	44 3/4	- 1/2	-1.1
O	GANDALF TECHNOLOGIES	10- 22	14 5/8	- 3/8	-2.5
N	GEN'L DATA COMM IND	6- 18	17 7/8	+ 1/8	+0.7
O	GENERAL TERMINAL CP	0- 4	5/8	0	0.0
O	GREAT SOUTHWEST IND	2- 9	3 1/2	0	0.0
N	HAZELTINE CORP	22- 43	40	- 1/4	-0.6
O	ICOT CORP	3- 9	7 5/8	- 1/4	-3.9
O	INFORMATION INTL INC	10- 22	17 3/4	-1 3/4	-8.9
O	INTEL CORP	21- 46	41 1/4	-4 5/8	-10.0
O	IPL SYSTEMS INC	5- 9	7	+ 1/2	+7.6
A	LUNDY ELECTRONICS	7- 14	12 3/4	- 3/4	-5.5
A	MSI DATA CORP	14- 36	33 3/4	-2 3/8	-6.5
O	NETWORK SYSTEMS CORP	15- 42	35 3/8	-3 3/4	-9.5
O	OMEX	3- 8	3	0	0.0
N	PARADYNE CORP	24- 50	42 3/4	- 1/4	-0.5
A	PENRIL CORP	7- 12	9 3/4	- 1/4	-2.5
O	RAMTEK CORP	12- 21	20 1/2	+1 3/4	+9.3
N	RECOGNITION EQUIP	4- 12	10 3/4	- 3/4	-6.5
O	SCAN DATA	1- 5	1 1/4	0	0.0
N	STORAGE TECHNOLOGY	16- 40	23 1/2	- 1/8	-0.5
O	SYKES DATATRONICS	6- 34	13 1/2	- 5/8	-4.4
A	T BAR INC	7- 12	11 1/4	- 1/4	-2.1
A	TEC INC	4- 12	8 3/4	- 1/2	-5.4
N	TEKTRONIX INC	34- 66	65 1/4	+ 1/2	+0.7
N	TELEX	5- 27	25 1/8	+ 1/2	+2.0
O	TESDATA SYSTEMS CP	3- 10	7 3/4	- 7/8	-10.1
A	TIMEPLEX INC	7- 23	21 7/8	+ 1/8	+0.5
O	VISUAL TECHNOLOGY	9- 19	17 3/4	-1	-5.3
O	WILTEK INC	1- 3	1 3/4	- 1/8	-6.6

SUPPLIES & ACCESSORIES

EXCH		PRICE			
		1982-83 RANGE (1)	CLOSE JAN 26 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	11- 19	18 1/8	- 3/4	-3.9
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	13- 22	18 7/8	- 1/2	-2.4
O	CYBERMATICS INC	1- 1	7/8	0	0.0
A	DUPLEX PRODUCTS INC	12- 20	18	0	0.0
N	ENNIS BUS. FORMS	16- 30	25 1/2	0	0.0
N	3M COMPANY	49- 80	74	-5 1/4	-6.6
N	MOORE CORP LTD	26- 44	42 1/4	- 1/8	-0.2
N	NASHUA CORP	9- 19	10 3/4	- 5/8	-5.4
O	STANDARD REGISTER	32- 72	61	-5	-7.5
A	TAB PRODUCTS CO	12- 29	28 3/8	+ 1/2	+1.7
N	WALLACE BUS FORMS	22- 50	49 3/8	+ 1/8	+0.2

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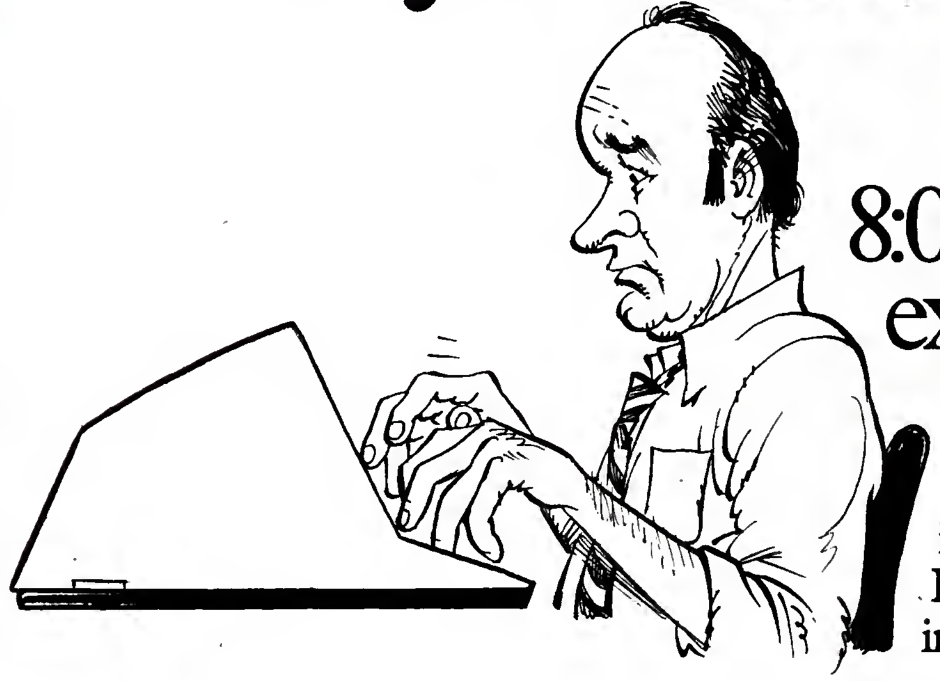
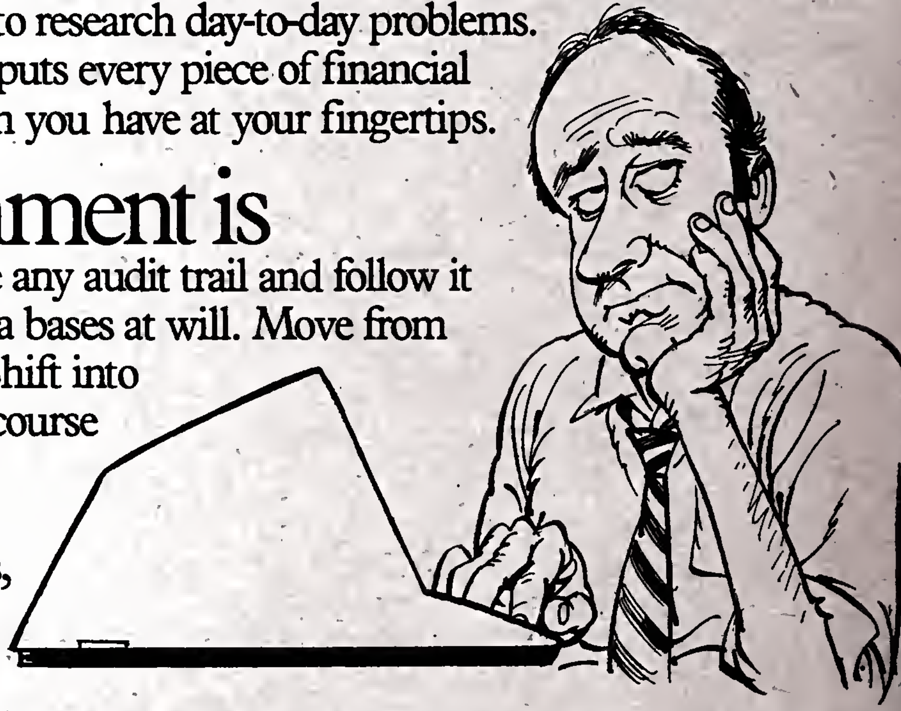


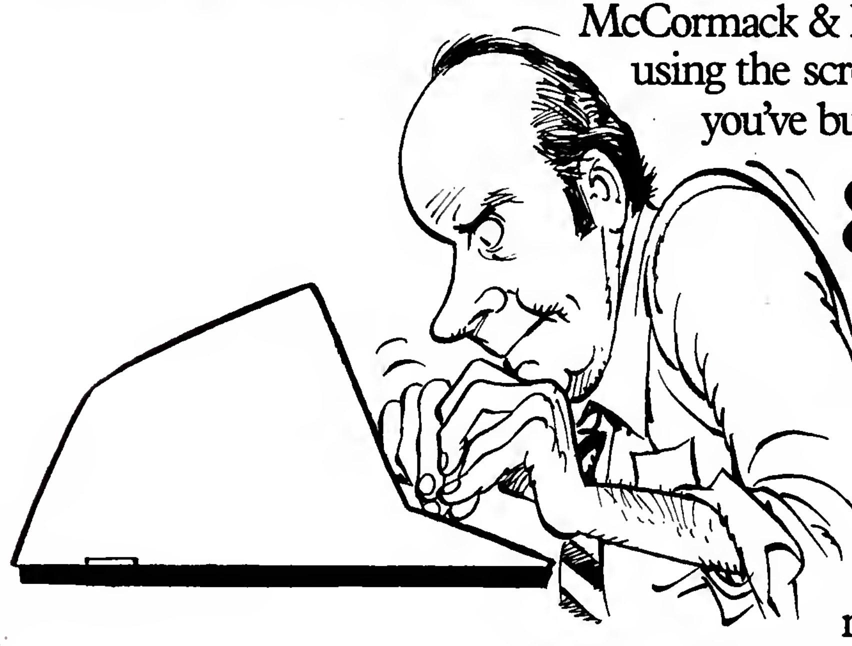
8:00 a.m. The boss says sales expenses are too high.

HiLite is a true accounting breakthrough. It lets you come up with answers in minutes instead of hours or days. No on-line query system in the world matches its ability to research day-to-day problems. It literally puts every piece of financial information you have at your fingertips.



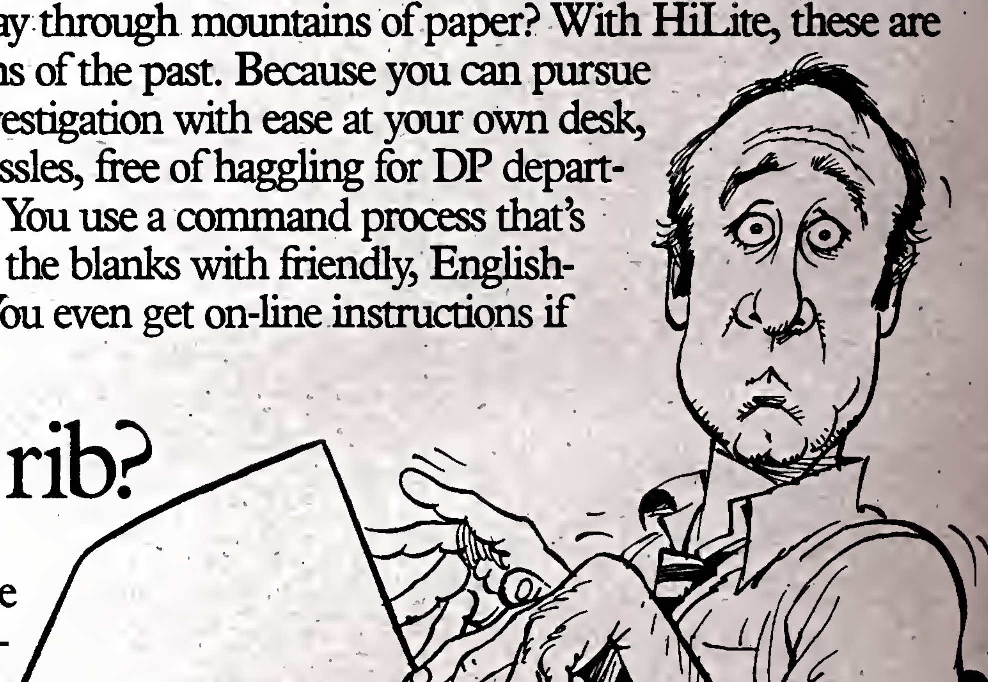
8:02 a.m. Travel and entertainment is out of whack.

With HiLite, you can choose any audit trail and follow it to completion, criss-crossing data bases at will. Move from General Ledger to Accounts Payable to track sales expenses. Shift into Fixed Assets to pinpoint depreciation discrepancies. Change course 180 degrees and probe Personnel/Payroll for minority quota details. Search backwards and forwards through any and all McCormack & Dodge systems, using the screens that you've built.



8:04 a.m. Let's look at salesmen's expense reports.

Remember overnight turnaround times? Remember inching your way through mountains of paper? With HiLite, these are problems of the past. Because you can pursue your investigation with ease at your own desk, free of hassles, free of haggling for DP department time. You use a command process that's as natural as your normal thought process. You just fill in the blanks with friendly, English-like instructions, and your answer pops up on the tube. You even get on-line instructions if you hit a snag, simply by pressing a button.



8:06 a.m. $1,000 for prime rib?

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